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The Budget System *in* RUBBER MANUFACTURING

A. T. HOPKINS

¶ *The proper use of budget control in manufacturing leads to prompt shipments to customers and consequent satisfaction.*

¶ *It also produces goods at a minimum cost and with a reduction in raw material and in process inventory and a consequent increase in cash capital.*

¶ *This system described in the accompanying article is very simple and it can be expanded to suit the needs of a large and complicated business.*

THE foundation of a manufacturing budget covering continuous production, is an accurate forecast of future sales. Such forecasts must be based upon existing contracts, possibilities for new business, the seasonal trend in the industry and general business conditions.

The production department maintains a record of orders received, production, finished stock and shipments, classified by items. These control sheets are posted daily. At the end of each month the sales department presents an estimated shipping schedule covering a three months' period.

A report is then drawn up under each item showing the article, the amount of factory stock, amount in production, unfilled orders, available for new business, average monthly sales for twelve months, sales last month, estimated for three months, and additional stock authorized. One sheet is required for each article and the sheet is ruled for twelve monthly reports.

The final item "stock authorized" shows the amount of stock authorized to be made in the next ninety days. By adding these and the special goods ordered together, the production department can make its ticket to the best advantage for manufacturing and shipping.

At this stage material requirements become important, specifications are necessary for the scheduling of the proper materials and it is obvious that reasonable standardization will reduce the varieties of material and simplify all the following operations. In working up such specifications consideration will be given to standardizing on the fewest raw materials that will serve our purpose and also on the fewest and most profitable sizes and plies of goods. Standard weaves of fabric and standard sizes and shapes of wire are surprisingly cheaper than specials. Material costs in the rubber business are almost always the large costs and specifications are the controlling factor.

The aim should be not cheap goods but goods suited to the purpose, and there are frequently large economies possible while making a better balanced article. For instance, in a piece of hose the fabric should be strong enough to stand the necessary pressure and strain and of a texture to take the proper friction. The tube and cover should be of a quality to balance the fabric. In many cases fabric has been used that was unnecessarily strong and the tube and cover of so inferior a quality that it would inevitably give out first. Now the irony of this is the fact that the cost of the fabric is much greater than the cost of the rubber compound used.

However, with the aid of specifications, the amount of raw materials required, including textiles, rubber, reclaim, compounds, and wire can be readily figured. A form should be filled out each month showing raw materials used last month, estimated this month, estimated three months, and the amount on hand. This gives the purchasing department sufficient information to cover on prices and quantities.

The actual purchase of materials calls for close cooperation with the manufacturing and finance departments and a close watch on the trend of prices, but, generally speaking, the amount of raw materials on hand should be kept at the lowest practicable figure. The best way to accomplish this is by the use of maximum and minimum standards, revised frequently. Each material should be kept separate and stock record cards maintained. From the stock record cards it is

easy to prepare a monthly statement of dead or slow moving material which should be promptly salvaged thus increasing the cash capital.

No matter how small the factory it will pay amply to have physical and chemical tests made on raw materials as received, also yardage and weights should be checked. Such a laboratory need not be elaborate, but if none exists, arrangements can be made with some general laboratory. Tests are necessary for intelligent buying and for proper handling of production problems and as a check on the quality of finished goods. Such laboratory control if not carried to excess will pay large dividends.

The amount of goods to be made having been determined, the next step is the planning and ordering of work on the "ticket." A well planned ticket is necessary for several reasons. Goods must be made for prompt delivery. Goods must be made at a minimum labor cost. The ticket must be planned to produce all the goods possible in a given time and department. If the ticket is not completed, however, confusion exists.

The type of ticket differs for various factories and kinds of goods, but in general the planning department decides on the ticket, so much special goods and so much stock, and then orders the preparation of the different parts that go to make up the finished article. These are delivered at the proper time at the bench or machine where the assembly or production takes place, and as only enough for the day's work is delivered, there will be no excess amount of goods in process and the available working space will be fully used. Completion of the ticket will mean that the goods can be shipped on a certain date, and consequently promises can be made and kept, and service given to the customer.

MANUFACTURING BUDGET

Date	Article	Factory Stock	In Production	Unfilled Orders	Available for New Business	Average Monthly Sales 12 Mos.	Sales Last Month	Estimated 3 Mos.	Additional Stock Authorized

FORM 1. MANUFACTURING BUDGET FORM MADE UP EACH MONTH FROM ESTIMATES BY THE SALES DEPARTMENT AND FROM THE RECORDS OF THE PRODUCTION DEPARTMENT.

RAW MATERIAL BUDGET

Date	Article	Used Last Month	Estimated This Month	Estimated 3 Mos.	On Hand	Ordered

FORM 2. RAW MATERIAL BUDGET FORM MADE UP BY THE PRODUCTION DEPARTMENT FOR THE BENEFIT OF THE PURCHASING DEPARTMENT.

New Magneto Coupling

RUBBER inserts have been used in magneto couplings for automobiles for some time. Various advantages over previous types are claimed for the coupling here shown.

Figure 1 is the complete coupling, and in Figure 2 are shown the four principal parts. The external drum *A* carries the driving hub for the magneto, the driving member *D* carries the hub for connection to the motor. Part *D* has four radial parts which fit into corresponding grooves in the rubber part *C*. This consists of a special rubber and fiber compound which is not affected by oil, benzine, or water. Part *C* with its grooves fits into part *B*, which is cylindrical on the outside and, after the ignition time has been set, can be lodged in the drum *A* by spreading. Part *B* has a lateral flange on the right side which prevents any lateral movement and play on the part of the member indicated by *C*.

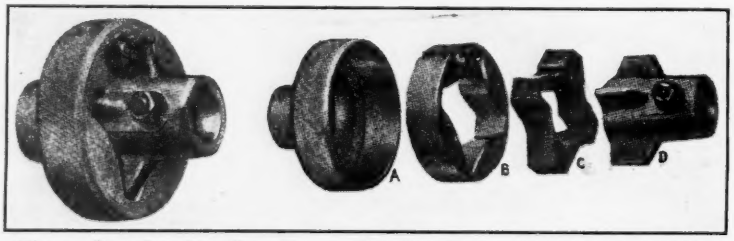
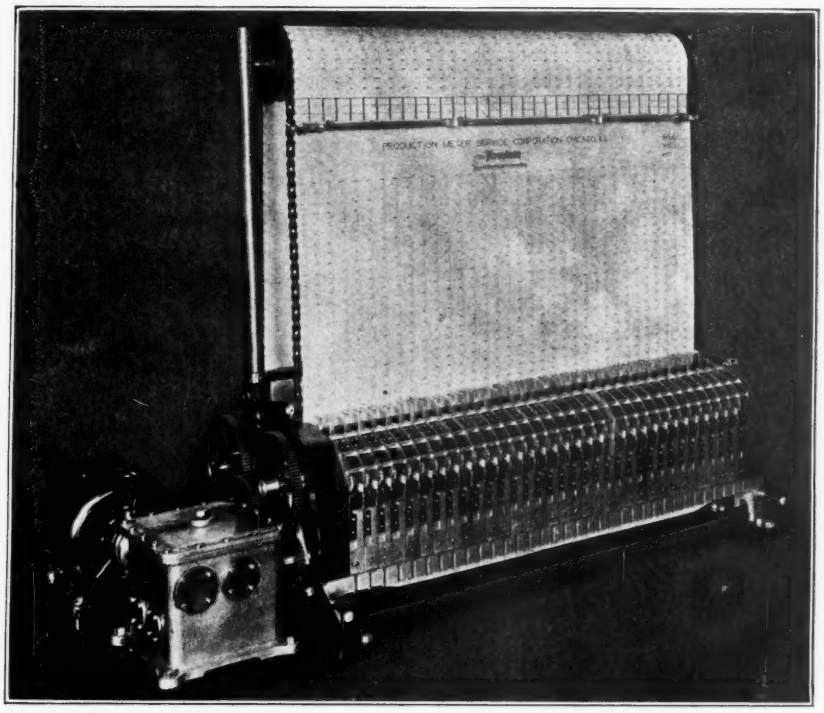


Fig. 1—Complete Coupling. Fig. 2—Principal Parts, of Which C Is Rubber.

The special advantage of this construction as compared with other elastic magneto couplings in which the elastic element is placed lengthwise, is that there are very large contact surfaces between the various parts entering into its construction and the elastic member has no torsion forces to absorb.—*Gummi-Zeitung*, No. 18, Feb. 1, 1929.

Curing is accurately timed by the Production Meter which records 34 stations and shows a graph of idle and production time of tire building, bias cutting, etc.



The Production Meter

H. B. Bixler[1]

TO secure the maximum of production and maintain a fixed time cycle of operation of the various machines used to produce rubber goods is the ambition of every factory manager. Numerous appliances and schemes have been tried in the past and the necessity for a machine or instrument that will record the actual time of cures as well as regulate the time, show the number of undercures and overcures, and the number of heats made per mold, etc., and at the same time give a comparison between shift production and day-by-day production, is more pronounced than ever. This is particularly due to the modern trend of shorter cures which naturally call for a much closer regulation of time of cure than was formerly necessary. For instance, most of the plants that are manufacturing molded inner tubes are working on a five-minute cure and if the cure is cut one minute there is a 20 per cent undercure or if the cure is lengthened to six minutes, there is a 16 2-3 per cent overcure.

To meet the demand for a recording and regulating instrument, the production meter was developed and it has been in successful operation in some of the largest rubber plants with marked success.

This device is provided with a chart divided in hours and minutes, the minute spaces being exactly 1/10-inch wide so that readings to ¼-minutes are easily and clearly shown. This chart is driven by a master clock at a speed of 6 inches per hour, the chart being of sufficient width to accommodate 34 simultaneous records on as many molds or other production devices.

The record is made by a pen which in turn is electrically controlled by a contact-making switch placed on the machine in the plant. This switch is entirely enclosed and cannot be operated in any way except by the operation of the machine. The meter can, of course, be placed at any distant point from the machines and is usually placed in the factory office where it is under the supervision of the works manager.

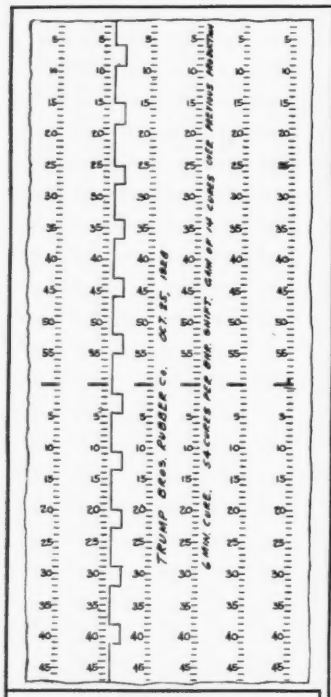
The operation of the meter is very simple, and the electrical connections are quickly and easily made at very small cost as ordinary twisted pairs of telephone wire are used.

When the mold is closed, the contact switch closes also, and the pen arm is moved on the chart to the "on" position and remains there to record the elapsed time until the mold is opened, thus accurately recording the exact time of the cure. On opening the mold, the switch is also opened and the pen arm is returned to the "off" position and remains there as long as the mold is left open, thus recording the exact time required or consumed by the operator to unload and reload the mold and start the next cure. It is readily seen from the above explanation that the number of heats has also been accurately recorded.

When all of the above mentioned operations have been accomplished, the question of how the operator will know when the time of cure has elapsed so that he may open the mold at the proper time to prevent under and overcures, naturally presents itself. This is accomplished in a very simple and positive manner by the predetermined time unit which is incorporated in the meter and is an integral part of it. This operates from the master clock also, and is synchronized with the chart travel as it is geared to the time shaft, driving both the time units and the chart.

The time dial, which has a range of fifty-five minutes in steps adjustable in seconds, is set for the proper length of cure. The electro-magnet which closes the small clutch is

[1]Akron representative, The Production Meter Service Corp., 1315 So. Wabash Ave., Chicago, Ill.



Operating Data
Press..... 48 x 48 10 Opening
Product..... Auto Floor Mats
Curing Time..... 6 Minutes
Loading Time..... 2 Minutes 30 Seconds
Time Cycle..... 8 Minutes 30 Seconds
Shift..... 8 Hrs. (480 Minutes)
Possible Production 56.4 Cures
Actual Production.. 54 Cures
Efficiency..... 95.8 per cent
Before Time Signal Was Installed
Possible Production 56.4 Cures
Actual Production (Average) 40 Cures
Efficiency..... 71 per cent
Loss..... 24.8 per cent
Cures Lost..... 14
Loss in production at $5.00 per cure - $70.00 in 8 hours, or in three shifts per day -- $210.00 per day.

Fig. 1.—Record of Press Performance

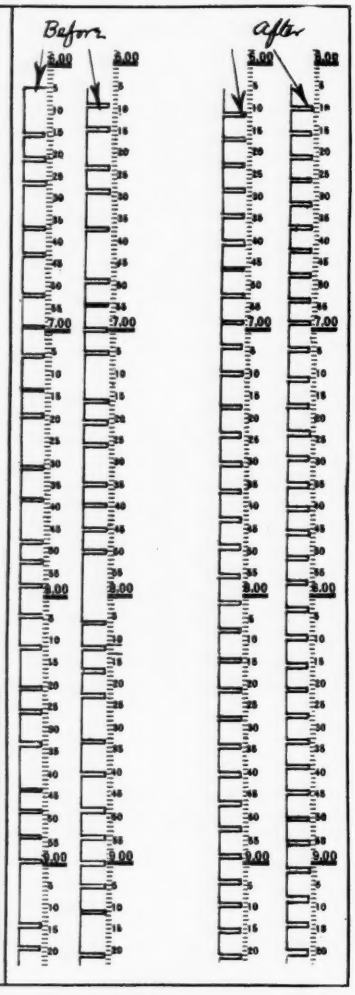


Fig. 2.—Record on Tube Molds

in series with the pen-arm magnet, both coils being controlled by the machine switch. When the mold is closed, the current flows through both coils, the pen arm is moved to the "on" position and the contact member of the time unit starts to travel towards the contact and reaches it thus closing a signal circuit at exactly the time the dial is set for. This signal remains "on" until the mold is opened, when it is disconnected and the time unit is automatically reset to the zero time position and will not move forward again until the mold is closed for the following heat. This signal may be visual or audible or a combination of both and is placed directly over the mold or in view of the operator.

If it is desired to open the mold automatically at the end of the predetermined time, this same circuit is used and with the proper operating device will open the mold, turn off the air and steam lines, and perform all of the operations that are normally done by hand.

This control is centralized at the meter for all molds and, as each unit is independent of its neighbor in its action, as many different time cycles can be utilized as there are time units in service. A great advantage in this centralized control is that should the length of cure be changed either permanently or for a certain stock, the management need not notify the operator except by resetting the time dial to the time desired and his signal will show at the desired time and he will operate accordingly.

The cost of operation for electric current will vary from $3 to $5 per month, depending on the cost per kw. Maintenance is reduced to a minimum due to the simplicity of the meter and the few parts subject to wear.

The uses to which the meter has been put in the rubber industry are many and the results obtained have been very satisfactory.

The record taken from meter charts recording press operations is an instance of increased production and the figures showing the value of goods turned out are authentic. This is shown in Figure 1.

The reprint of an actual record taken on tube molds is shown in Figure 2 and clearly demonstrates the increase in production and the uniformity of cures. The "before" record was taken without the knowledge of the operator and is a fair sample of how many variations there were in time of cure. Five days later, the "after" record was taken when the operator knew that his every move was being recorded in the "front office." After the predetermined time signals were installed, the record was even better, in fact as near perfect as is possible for it to be.

The data sheet, Figure 3, is a recapitulation of meter records as obtained from charts covering the operation of three shifts in one of the large plants in Akron. This again is a record "as found" and the number of off cures has been very materially reduced and production increased since the meter has been in operation.

The meter has also been applied to tire building machines, watch-case heaters, heel presses, bag and bottle presses, bias cutters, and large tire heaters.

Where the production meter has been installed the management obtains absolute plant control which cannot be secured in any other way as the meter records visually the volume of production and the performance of each individual machine in the plant to which it is attached. From it a complete report is made up for the preceding day showing the running time of each machine, the reason for not operating, the percentage of productive time and the quantity produced. This enables the manager to apply the proper remedies for shut-downs, time delays due to

ENGINEERING DATA SHEET.

Compiled by ....R.B.... Akron, O. Office
Customer ..(Name on Request).. Date Jan. 15, 1929
Machine ....Tube Molds.... Dept. Inner Tube
Shift No. 1 - 2 - 3 Time On ..... Time Off .....
Length Of Cure....5.... Min. Time Cycle....8½.... Min.

RECORD OF CURES
Time In Minutes

This record was taken from PRODUCTION METER charts on 32 tube molds and shows operating conditions as found. The number of "off" cures has been reduced to a fraction of the number shown since the meter has been in daily use.

Heats Recorded	6749		
Correct Cures	3 911	58 %	
Over Cures	1825	27 %	Production Loss 174 Tubes.
Under Cures	1013	15 %	
Total Off Cures	2838	42 %	
Time Lost 97 hr. 23 Min.			Production Loss 1022 Tubes
Max. Production Possible	8064		Total Loss 1196 Tubes
Actual Production	6749	83.6%	

Fig. 3.—Recapitulation of Production Meter Records

repairs, lack of prepared stock movements, etc. He is in constant touch with every operator and sees just what is happening when it occurs.

For time study work the meter has wonderful possibilities as the records are accurate beyond question and allow a comparison of a number of machines for as long a period of time as found necessary to secure the desired information. These time study records are obtained and tabulated in a matter of hours as against days for the ordinary method of securing the desired data.

Aluminum in Rubber Work

The Uses of Sheets and Foil

NOTHING more readily picks up loose bits of stray material of every kind than uncured rubber. Because of this and the necessity of keeping the stock scrupulously clean, wooden bins for stock storage or wooden top tables for cutting or working sheet rubber cannot safely be used. This elementary fact was early learned and accounts for the generous use of sheet zinc as table top covering and cutting boards in every rubber plant.

Hitherto sheet zinc was the only sheet metal practically available as topping for rubber workers' tables. Now, however, an equally suitable metal for the purpose, and possibly even a better one, is available in sheet aluminum. This material is free from all crystalline or flaky inclination and so will not contaminate the rubber by particles of detached metal.

Aluminum is a metal to which rubber has the least tendency to stick, a metal strongly resistant to chemical attack and indifferent alike to moisture, sulphur, naphtha and talc.

The same qualities that make aluminum desirable for work table tops apply with equal force to its use as lining for bins, stock racks and other surfaces where rubber, mixed or unmixed, cured or uncured, is to be placed. The initial expenditure is fully justified by the increased durability and assurance of cleanliness secured.

One of the common uses of thin sheet aluminum is for making embossed lettered labels for wrapped and molded goods. The metal has sufficient stiffness to maintain the lettering and designs in clear outline under pressure, and after vulcanization is readily stripped from the article leaving a clean highly polished label of the desired color.

Ebonite sheets are regularly vulcanized between sheets of tin. One of the difficulties encountered with foiled ebonite sheet is that, after vulcanization, the surface of the ebonite exhibits an objectionable metallic luster when the foil is removed. Sometimes small pieces of metal are found embedded in the surface. The reason is found in the nature of the foil employed, usually tin or tin with a small addition of lead.

This trouble is completely eliminated when aluminum foil is substituted. There is no tendency whatever for aluminum to adhere to the ebonite or to flake off. Ebonite sheets foiled with aluminum are produced with a beautifully polished deep black appearance.

The use of aluminum for this purpose confers additional advantages. Since it strips very easily after vulcanization it can be used repeatedly. It is reported that by careful manipulation, the same aluminum sheets can be used for 20 consecutive foil vulcanizing operations before replacement becomes desirable. The sheet when no longer useful for foiling is still capable of use in other applications. Alternatively it can be melted and cast into molds or sold as scrap.

Another advantage of aluminum is that it can be used in lighter gages than tin for foiling ebonite. Tin sheet is usually employed 0.2 to 0.3 mm. but aluminum can be used in thicknesses of 0.15 to 0.2 mm. Aluminum in the annealed temper used for foiling is sufficiently soft and pliable for the purpose while having sufficient hardness to justify this reduced thickness. This fact in conjunction with the basic cheapness of aluminum in comparison with tin, means a much reduced outlay in first cost.

Salvaging Waste Fiber and Rubber

SALVAGING operations as applied to waste rubber such as old tires, etc. have hitherto been confined practically to recovering and regenerating the rubber separate from the fibrous components of the articles which is destroyed in process and allowed to go to waste.

A process recently patented[1] reveals a practical method by which waste articles such as old automobile tires or any vulcanized constructions of rubber and fabric can be salvaged, recompounded and again molded into useable forms. The process is detailed as follows:

A rubber-bonded dry molding composition which is not tacky nor liable to oxidation is obtained by treating granular or fibrous fillers with diluted latex, containing a protective colloid such as haemoglobin and preferably zinc oxide, drying the mass, and comminuting or shredding it. The product may contain as little as 5 per cent of rubber, which is generally in gel form but may be more or less coagulated if the amount of protective colloid is limited.

When fiber is used in the form of cords, the reaction that occurs between haemoglobin and zinc oxide on agitating or warming may be used to thicken the latex to prevent it from penetrating the cords, or when the cords are partly penetrated the reaction may be brought about to prevent further penetration, or the cords may be treated with a coagulant. Apart from cords the fillers may be asbestos, cotton, comminuted old tire stock, granular material, whiting, talc, etc., and sulphur and accelerators may be included.

In an example, haemoglobin (3 parts) is dissolved in diluted latex (8 parts rubber), sulphur is added (3.2 parts) and then litharge, zinc oxide, bauxite, barytes, and whiting (28.2 parts). The mixture is agitated and warmed to 100° F. and assumes a batter-like consistency. Some water is added and 60 parts of short-fiber asbestos is stirred in. The wet mass is dried in trays in suitably conditioned air at not more than 150° F. and the resulting slabs are disintegrated in a toothed shredding machine. The granular material may be graded by sieves, the finer portions giving stronger products.

To form a switchboard panel the granular material is compressed for a few seconds at 2 tons per square inch at a temperature somewhat above the melting point of sulphur, which reduces its bulk to one-third, and the whitish panel is finally coured in an open mold. Black panels may be got by surfacing with a layer containing more rubber, or with a synthetic resin compound.

[1] British patent No. 302,151. Feb. 6, 1929.

Silver Plated Hard Rubber

Non-dentable and Practically Indestructible Silverware

A NEW manufacturing process of interest to hard rubber manufacturers is particularly concerned with the silverware and jewelry trades. The market for silverware for decorative and toilet uses has been limited by the inherent fragility of such articles. In the past it has been necessary to employ two or more materials of contrasting qualities, such as a body of wood or similar substance, a filling of resinous or other adhesive matter and finally a covering of silver sheet. Obviously the thin surface covering of metal is entirely inadequate to withstand even ordinary daily wear and tear, and in the event of being dropped the filling is fractured, the covering is dented and the beauty, if not the utility of the article, is a thing of the past.

In the construction of articles from which a high degree of service is required all possible objections to the employment of silver has been eliminated by the development of a new process. By this process absolutely perfect integration is obtained between a non-metallic base of hard rubber and the silver exterior of the article, irrespective of its size or shape. In fact for all practical purposes the joining is non-existent and the product may be regarded as a single piece article.

Military Set and Shaving Brushes of Silver on Hard Rubber

The illustration represents a group of toilet articles including military brushes, a silver backed comb, and shaving brushes, each item of which is basically made of molded hard rubber overlaid with a heavy coating of silver applied by the electroplating process. The method by which this is done is known as the Warren process[1].

It is adapted to deposit a metallic coating of any non-ferrous metal to any thickness required onto a large variety of non-metallic bases, such as ebonite, bakelite, fiber, asbestos, ceramics, wood, etc. This process apparently makes possible many new applications of hard rubber.

In outline the process comprises the following steps. An article to be plated is molded in hard rubber cured in a press for 25 minutes at 80 pounds of steam. After molding, the deflections in the article are painted with silver oxide dissolved in chloroform. The final cure in the vulcanizer is then made for 1½ hours. The piece is next put into a bath for the reduction of the silver sulphide to metal. The reducing bath is made up as follows: 3 ounces of potassium cyanide and 1½ ounces of sodium bisulphite. Each chemical is dissolved separately in warm water and the solutions are then poured separately into a gallon or appropriate multiple of water which should be at 130° F. at which temperature the reducing bath should be kept. This bath is electrolytic and should have a voltage across the terminals of 6 volts. The connections to this bath should be at least ⅛-inch copper and the suspending wires equally thick. Reduction takes place in this bath in 10 minutes. After reduction has taken place, which it does with the ebullition of a certain amount of sulphureted hydrogen and apparent liberation of sulphur, the articles are washed in running water, care being exercised to keep the articles wholly immersed.

This process entirely removes all possible objections to the employment of silver in the construction of articles from which a high degree of service is required, and also imparts additional attractiveness to silverware products of all kinds.

[1] Controlled by the British Metallising Co., Ltd., London, Eng., represented by Alex. Leo Wallau, 1182 Broadway, New York, N. Y.

The National Safety Council

ORGANIZED to prevent accidents, the National Safety Council is financed by 4,650 members, representing 153 industries, government departments, community safety councils, educational institutions, libraries, chambers of commerce, motor clubs, insurance companies, various national, state and local professional, trade and business organizations and public-spirited citizens. It is a cooperative, non-profit making institution, promoting safety, sanitation and health in the industrial, public and home life of the American people. 1,000 committeemen serve without financial compensation, meeting regularly to determine its policies and program. The organization serves as a national clearing house of accident prevention information, maintaining its headquarters at 108 E. Ohio St., Chicago, where a staff of more than 80 employes devote all of their time to safety work.

The first safety congress was held at Milwaukee, 1912, and a formal organization meeting was held in New York City in 1913, when the body was originally started as the National Council for Industrial Safety, a name which was changed inasmuch as the scope of the institute broadened to include safety on the streets and highways, in other public places, at home, on the sea and in the air.

The first president was Robert W. Campbell, attorney for the Illinois Steel Company, a son-in-law of the late Judge E. H. Gary, who was one of the early safety leaders.

The first secretary was William H. Cameron, who is still with the organization, now serving as managing director. It was Mr. Cameron who opened an office with only a handful of members and a few hundred dollars in cash. Last year the council spent more than $664,000 in its perpetual safety campaign and its affiliated units expended a similar amount.

The first congress held in Chicago was in 1914.

It is the contention of the council that practically all accidents, irrespective of where they occur, can be prevented through intelligent, organized safety work.

Semi-Annual Survey of Tire Dealers Stocks

The Rubber Division, Department of Commerce, Washington, D. C., is sending out forms for its regular semi-annual survey of dealers stocks of tires which takes place April 1. Tire dealers are urged to fill out and return these forms promptly. They are in two colors: canary, for those dealers who reported last October; and white, for those dealers who did not report. The questions are the same on both forms. But the different colors are necessary to check the mailing list. Provision is made for dealers to be supplied with a report of the results of the survey if they so desire.

Ornamented Rubber

A Review of the United States Patents Relating to the Methods of Variegating, Coloring and Ornamenting Rubber

JOSEPH ROSSMAN

MANUFACTURERS have been impressed during the last few years by the fact that the attractive appearance of an article greatly increases its salability. There has been a widespread application of color to many prosaic articles such as stoves, cooking pots, and household utensils. Many articles which were made of a single drab color are today very attractively ornamented in order to please the esthetic sense. This artistic movement has also reached the rubber industry, particularly in clothing, druggists' sundries, and specialties. Many patents have been recently granted for ornamenting rubber articles. The ornamentation of rubber, however, has been attempted long ago.

Vari-Colored Rubber

An early patent to Joseph Beck, U. S. Patent No. 93,335 granted in 1869 describes a process for making vari-colored rubber which simulates the graining on wood, the veining of marble or the variegated color effects such as seen on a Paisley shawl. In such sheeting the rubber stocks are formed into a homogeneous sheet by being passed through heated rolls which cause the streaks of color to show on the surface in generally parallel streaks, or striated form, extending longitudinally of the sheet as delivered from the calender.

In the process described by Beck and as it since has been practiced commercially the ingredients of the composition have been confined to rubber, either crude or reclaimed, or a combination of both, colored as may be desired. With such material it has been found to be extremely difficult to cause the vari-colored stocks to blend in a manner to obtain a faithful reproduction of the surface effects above named. The difficulty lies in that while the milling and calendering processes develop a grain in the stock, this grain is not of itself sufficient to cause an association of the vari-colored stocks in the proper manner to create the desired effects. The colors, having no component flow retardative element in the compound, will readily flux, producing a color blur instead of the desired distinct mottle. Briefly, the stock needs reinforcing.

A Recent Process

An object of a recent U. S. Patent No. 1,482,952 is to produce a variegated vulcanized rubber flooring of blended rubber color stocks which have as a component reinforcement of cotton or like fiber that has been mechanically finely comminuted and intimately associated with each color stock. When such color stocks are mixed, the reinforcement of cotton fiber in the condition described so controls the movement of the colors during their mingling as to cause a resistance to amalgamation and, thus retaining their color identities under a sufficiently prolonged period of mixing, to form the fine grained or striated surface effects so much desired.

Friction scrap such as the waste from tire manufacture, belt and hose making may be used in this process. The cotton fibre is masticated and mixed with rubber and pigment. The batch is then passed through a mill and formed into a rough sheet. This is then passed several times through a refining mill which serves to draw out the sheet.

Different color stock is thus prepared separately. The various colored compounds in the selection desired for the flooring to be made are warmed up separately, preferably being brought to almost a soft mastic state. In this condition the various batches of compounded rubber, each containing refined friction, are mixed together on the warming mill preparatory to calendering. A greater quantity of one colored compound is used to form a base color for the flooring, this being selected in accordance with the type of flooring to be produced. This operation forms a rough blend of the colors throughout the body or base color, and the colors with the cotton fiber shreds extending throughout the mass, are drawn into more or less parallel relation. The sheet delivered from the mill is thicker than desired, and the blending of the colors is completed by passing it through a calender. The sheet is then placed in a vulcanizing mold or press and cured in the usual way.

Marbled Rubber

Another recent patent to Mell, U. S. Patent No. 1,619,359 produces rubber sheeting having a mottled or marbled appearance by mixing differently colored masses of vulcanizable rubber compounds, sheeting the mixture between calender rolls, and then splitting or slicing the sheet into thinner sheets. A very superior imitation of marble, as well as various other striking color effects may be obtained, the difference in surface appearance being apparently due to the fact that the action of the calender rolls produces a smearing and thinning out of the margins of the color zones at the surface of the sheet which does not occur in the same form within the body of the sheet, wherefore the splitting of the latter exposes a more clear cut surface design. Different bloom characteristics in the rolled surface and in the cut surface of the rubber also may account for the different surface appearance obtained. See group illustration.

Mottled Rubber Flooring

An old method of producing mottled rubber tiles for flooring involved the use of a plunger mold or press, in the cavity of which a mixture of small lumps or particles of different-colored raw stock is placed and subjected to pressure by the plunger, the mold being steam heated so that the tile is vulcanized at the same time that it is being compacted. This is an expensive method on account of the cost of the plunger molds, especially in large sizes, and the difficulty of manipulating the raw materials and the product.

According to U. S. Patent No. 1,215,382 a backing of relatively cheap stock is employed and only a facing of costly stock for a wearing layer, and instead of pressing and curing the tile in a plunger press, there is prepared a slab of the cheap backing material composed of hard rubber or resinous compound, or it might be wood, fiber, straw board, or any suitable substance of sufficient hardness and body, on which is spread a loose layer of various colored particles of face material. The two are passed between calen-

der rolls, either cold or slightly heated, which have the effect of squeezing the particles of face material into a welded or nearly homogeneous layer upon the backing.

After calendering the composite slab is cured in a press, preferably with its edges confined by a rectangular frame. The curing pressure and heat serve to consolidate the face of the slab with the backing as well as to vulcanize the product, thoroughly weld the particles of the facing and impart a smooth surface thereto, the result being a very pleasing mottled appearance. By the proper selection of colors various marble and colored stone floorings may be imitated but the new flooring is superior to stone on account of being quiet and less slippery. See group illustration.

Ornamented Rods and Tubes

Rubber rods or tubes have been made of two or more colors. In U. S. Patent No. 1,516,843 a machine is used for incompletely mixing or streaking a plurality of plastic compounds of contrasting colors, each with the other, separating them by forcing the incomplete or streaked mixture through a plurality of passageways, and subsequently joining the various mixtures just previous to the time it is forced through a common orifice, which thereby acts to give to the finished article a very pleasing appearance resembling grained wood. See group illustration.

Striped Rubber Sheeting

The production of striped rubber sheeting has been carried on in several ways. According to one method a rubber sheet is first formed and then rubber strips of a contrasting color are cemented to the backing sheet in the proper position. The finished striped sheet consists of a backing sheet and many individual strips cemented to it. The production of such material is difficult and expensive and the finished product is not of uniform thickness throughout. Furthermore, cementing the strips is unsatisfactory since they may become loosened and displaced. In this method the rubber materials are vulcanized prior to the formation of the finished product.

In another method, uncured rubber is sheeted out and sheets of the desired colors are laid face to face and passed beneath a knife which makes a cut extending through the length of the sheets. In this cutting the edges of the two sheets are forced together and united. The two sheets are then opened up, laid flat, and passed through rolls which flatten the sheets at the line of union. By reason of the manner in which the edges are united, the sheets are not connected altogether by adhesion of their edges, but by adhesion of portions of the faces of the two sheets which lie in contact. After the formation of a pair of connected strips the process must be repeated to add a third strip, and eventually by repetition, the sheet may be built up to the desired width.

According to both processes just described the manufacture of the striped rubber sheeting is not continuous; that is, sheets of material of the color which are to appear in the finished product must first be formed and these sheets must then be cut into strips of the desired width and thereafter connected together to form the finished sheet.

U. S. Patent No. 1,603,812 discloses a method in which a finished rubber sheet is formed from the rubber mix in a single operation. The rubber is formed into strips of the desired colors and united into a sheet which becomes the finished product without further cutting, cementing, or operations of a similar character. This method produces the sheeting continuously and eliminates one step of the old processes.

One form of the apparatus by which this method may be practised consists of a calender provided with rolls of the usual construction. Associated with the rolls is a block having an extension which is given a contour so that portions of it will lie against the faces of the rolls. The block is formed so that the rubber is maintained in contact with the rolls but in separated relation and the extension is formed with a plurality of channels which, with the surfaces of the rolls, form feeding passages. These channels taper in width and, at their discharge ends, the width of the channels corresponds closely to the width of the strips which are to appear in the finished sheet. The discharge end of the extension is located close to the bite of the rolls and the discharge ends of the channels are placed so that strips of contrasting colors are fed between the rolls and assume the positions required by the pattern to be produced.

The supplies of rubber of different colors maintained in separated relation by the block, lie in contact with the surfaces of the rolls, and as they rotate the rubber compound is forced forward through the channels and discharged between the rolls in strips. These strips are then subjected to the action of heat and pressure by the rolls which result in their union into a single sheet. See group illustration.

Patterned Sheeting

Another recent U. S. Patent No. 1,634,955 makes patterned rubber sheeting for floor coverings in a manner analogous to the production of tessellated patterns in linoleum. The process consists in employing a partially vulcanized rubber matrix with raised elements having their upper faces substantially flush with each other and separated by open interstices. Unvulcanized sheet stock of uniform thickness is applied to the upper faces of the matrix and pressed against the raised elements in order that the flow of the unvulcanized rubber into the interstices shall not destroy the accuracy of the design.

By cutting the resulting mass through lines of color division therein, in a plane passing through the raised elements of the matrix, especially accurate and definite color demarkation may be obtained. The rubber composition which is to represent the greater area in the design is used for the matrix, in order that the raised elements may be of sufficient extent to resist distortion as the other rubber composition is pressed into the interstices.

Coloring Rubber Toys

The printing of rubber with colored designs has presented a number of difficulties. Rubber toys are colored with paints applied after the article has been vulcanized and consequently it is liable to come off by use. This has been obviated in an old U. S. Patent No. 247,838 by thoroughly mixing rubber and colored sulphide of antimony of the color required, dissolving the compound in naphtha or other suitable solvent to a thin fluid solution, painting the colors on the toys, and then curing them.

By another method the desired colors are applied to toys and other articles by running the compounds of rubber and sulphide of antimony, in all the various colors, into very thin sheets. From these are cut out patches of any outline of form desired. These are affixed to the surface of the toy by a fluid paint compound described and then the whole is cured together.

Printing Sheet Rubber

Uncured rubber sheets are very difficult to ornament with designs by the use of printing presses because it is almost impossible to handle the sheets without stretching or distorting them. For this reason printing multi-color designs has been absolutely prohibited owing to the impossibility of securing exact register in the successive impressions and of causing the sheets to stand in the press without collapsing.

According to U. S. Patent No. 1,516,598 a sheet of rubber stock of the desired thickness is run on a calender and laid on a sheet of holland cloth which constitutes a backing, the exposed side being dusted. After cooling the holland is

removed, exposing the undusted side which is then dusted very lightly. A sheet of paper is then applied to the lightly dusted side and pressed in close contact with it. The light dusting serves to prevent the rubber from sticking too tightly to the paper to interfere with its being readily stripped therefrom, while at the same time the adherence is sufficient to enable the composite sheet to be readily handled.

The designs to be applied on the rubber are composed of colored rubber composition or rubber inks and where the ornamenting is accomplished by a printing press using one or more colored inks, such ink is of colored rubber composition which will be united permanently to the rubber sheet by vulcanization. The surface of the rubber sheet should be dusted with a material which will not prevent the intimate union of the design stocks and sheet stock, or in other words which will not form a separating layer. For this purpose sulphur is a suitable material, since it removes the tackiness or stickiness of the surface, and thus facilitates the handling and application of the vulcanizing heat, becomes incorporated in the rubber and facilitates the permanent union of the rubber sheet and ornamenting material.

If the ornamenting is to be done by a printing press the rubber sheet with its paper backing is run through a suitable press of single or multi-color character as desired and thereafter the rubber sheet is stripped from the paper backing and vulcanized in the usual manner.

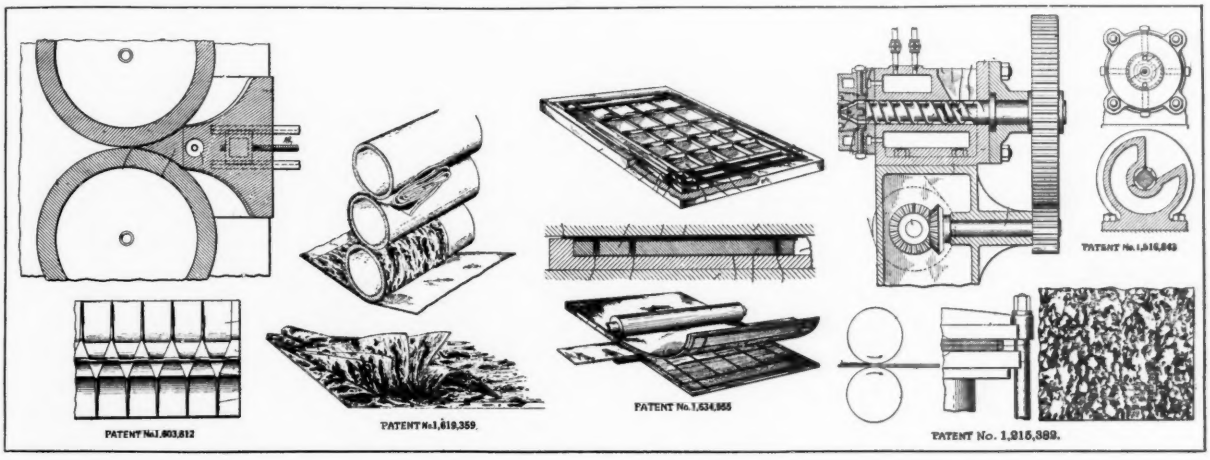
Dyed Rubber

Before 1914, colored rubber was produced with mineral colors, such as cinnabar, antimony cinnabar, iron colors, while of organic dyes only stearates of basic dyes of aluminum resinates of basic or acid dyes in solution in turpentine or similar liquids had been used for coloring the surface of thin sheets. Ditmar in his U. S. Patent No. 1,113,759 states that organic vat coloring matters can be used for coloring rubber by mixing the rubber with the dye with or without the addition of a substratum, and vulcanizing the colored caoutchoucs by heating with sulphur at the vulcanization temperature. It was highly surprising that the organic vat dyes could stand this process without injury to their valuable properties. As an example the following parts by weight are used: 100 parts of hard rubber are mixed between rollers with 6 to 8 parts of thioindigo scarlet R and the mixture is vulcanized at 170° C. A beautiful bright violet is thus obtained.

Applying Colored Trade Marks

Trade marks and designs have been applied to inner tubes, tires, belts, etc., by a number of methods. U. S. Patent No. 1,552,907 summarizes all the methods and their objectionable features as follows: One of these methods is to print or stamp the design, such as a trademark or other marking, on the article by the use of ordinary printing or stamping devices with the inks commonly used with them. Another or transfer method is to form the desired design in mirror image on paper, cloth or other backing, apply this face down to the article and after vulcanization to remove the paper or other backing. Still another method is by embossing or imprinting on sheet rubber during the calendering process, or to emboss or imprint on molded articles during the molding operation, either by the use of an engraved mold or by a removable template inserted in the mold. Still another method is to form embossed rubber designs on a sheet which are cut out from the sheet and then affixed to the article by cementing.

All of these methods are open to more or less numerous objections. In the case of designs printed or stamped on a rubber article with the use of the ordinary inks the design is easily rubbed off or worn away, if affixed to a rubber article which is required to flex the design cannot flex with the article and cracks and becomes illegible, and in addition the ordinary inks used for this purpose frequently contain ingredients which have an injurious effect upon the rubber.



The transfer method referred to is also objectionable in that the design is easily rubbed or worn off, is not flexible, and requires the removal of the transfer backing after vulcanization.

In the case of designs impressed on rubber during the calendering operation, such as emblems or trademarks applied to the shank portion of shoe sole stock, this method involves expensive engraving of the expensive calender rolls, and a separate engraved roll must be supplied for each design or emblem used, or as is common two such designs are engraved in alternation on the roll and in cutting soles from stock prepared on such a roll only the portions containing the design or emblem desired at the particular time are cut out and the rest of the stock becomes scrap.

In the case of articles which are formed with a design during a molding operation, this result must be secured either by engraving the mold, which is an expensive process and limits the use of the particular mold to articles having only that one design thereon, or else as in the case of molded articles such as rubber hose a thin embossed metal template is placed in the mold. In this latter procedure a master die is used to form the templates and they are ordinarily used but once. When the molded hose is removed from the mold the template is embedded in it and labor is required to dig it

out. This latter method also causes weakening of the wall of the hose and also causes projections on the inner wall which makes its bore irregular, and in addition the outer covering of the hose is frequently torn in removing a template from the finished article, rendering the hose defective and causing rapid deterioration at this point.

Another objection to embossed designs is that frequently it is desirable or necessary that the design be flush with the surface of the article, in which case the embossed designs cannot be used. Furthermore if an article is to be molded, a previously embossed design cannot be used since this will become distorted or obliterated during the molding operation.

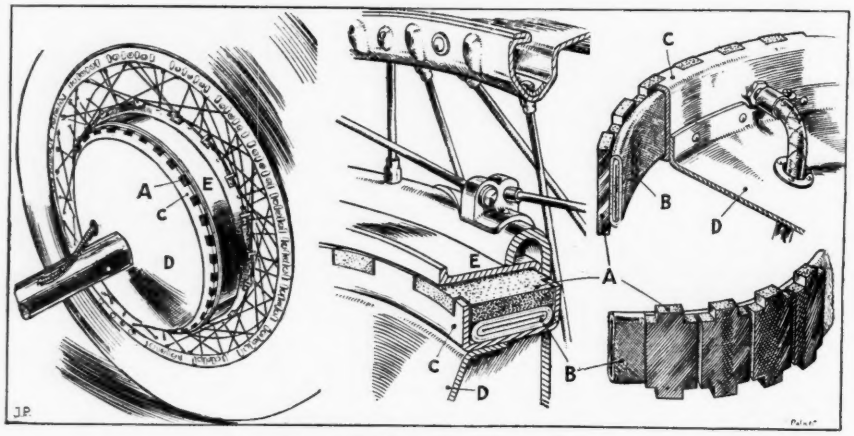
Serious objections to all of the above outlined methods are that fine designs or marks cannot be clearly produced and in the case of embossed rubber designs, the design and its background are of the same color and therefore the design cannot be distinguished except at a short distance, and the design itself of course cannot be in more than one color.

This patent aims to cure these defects by forming depressed portions, adhesively uniting a backing to the relatively elevated portions of the film, separating such elevated portions from the remainder of the film by stripping away the backing, and vulcanizing. The invention also includes repeating the previously stated steps when desired on the same backing, using depolymerized rubber of different colors to thereby form a design in colors, and it also includes disposing depolymerized rubber on a rubber backing in the manner above set forth, vulcanizing, and then applying the vulcanized design thus produced to a rubber article and uniting them with or without vulcanization, the design being disposed either on the surface thereof or inset flush with the surface thereof as by molding. (*To be continued*).

Rubber Airplane Brake

A Safe and Effective Device Affording a Shorter Landing Run

THE problem of airplane braking differs materially from that of braking automobiles in that the weight must be reduced to a minimum while maintaining the braking effect at a maximum. In general the efforts of designers seem to have been directed toward the utilization of the principal of the internal expanding 2-or 3-shoe type of brake. Such brakes, however, are excessive in weight and exert unequal pressures on the shoes with the result that the drums become distorted in service. These conditions increase the probability of untimely seizure of the brakes with injury to the machine.



The Palmer Brake for Airplane Wheels

A new development of the Palmer airplane wheel brake is considered to completely eliminate the drawbacks mentioned. The new braking device is exceedingly light in weight and gives exceptionally strong braking effect. It is of the fluid pressure type, and consists of an annular inflatable member to which are attached a number of brake blocks, which, when the brake is in operation, are forced into frictional contact with the inner side of the brake drum. The drum itself is much lighter than is normally employed, and this reduction in weight becomes possible because both the wheel, and the drum support as well, are made perfectly circular and concentric before the drum is placed into position.

The details of construction are shown in the accompanying illustrations. The special wheel located at the left of the picture is marked with letters indicating the details shown in the other two drawings. The fundamental principle of the design is simple. It consists in interposing between a fixed drum and a moving drum an endless rubber tube carrying a number of brake blocks. The wheel itself is designed to carry 2 drums one of which *E* is fixed by wire spokes to the rim of the wheel while the revolving drum is structurally connected with the revolving center disk *D* by the channel rim *C*. The moving drum comprises a flattened air tube *B* carrying on its outside circumference a number of brake blocks *A*. These brake blocks are stepped into recesses in the ring *C*, thereby preventing the blocks from revolving with the drum. When air is forced, by foot pressure, into the tube *B* it expands and in so doing brings the brake blocks into contact with the outer rotating brake drum *E*. The amount of friction grip exerted depends upon the air pressure in the tube.

The brake blocks are the only parts of the whole system where wear is likely to occur, and these can be renewed by the simple operation of lifting out the annular member and dropping another in its place. For this no tools are required other than those necessary for the removal of the wheel.

A very novel feature of the Palmer brake is the foot control relay valve, by means of which the braking pressure can be perfectly controlled, and the release of the brake made just as gradual as its application.

Another interesting point is that no manual effort is required to apply the brake. The pedal of the foot control relay valve is operated, and the feel of the brake obtained, in an exactly similar manner to that of an accelerator on a car.

The advantages of landing wheel brakes for aircraft are considerable. The take-off is shortened, as the engine may be run at a greater speed than when the wheels of the machine are chocked. The landing run is much reduced, so that alighting in confined spaces and on the decks of aircraft carriers becomes a perfectly practical proposition. The machine may be accurately steered when on the ground, so that man-hauling can be almost entirely dispensed with.

Rubber Association Rules

Governing Transactions Between Sellers and Factory Buyers of Crude Rubber

The Board of Directors and The Crude Rubber Committee of the Rubber Association of America urgently recommend that all rubber manufacturers make their purchases under these rules, in accordance with the "Standard Contract" and in conjunction with the "Official Crude Rubber Type Samples" adopted as of October 28, 1927, with description amended as of January 24, 1928.

THE "Rules and Regulations of The Rubber Association of America, Inc., (hereinafter called 'the Rubber Association') Governing Transactions Between Sellers and Factory Buyers of Crude Rubber in the United States of America," shall be as follows:

1. (a) Quality shall be as per Official Type Samples on file with the Rubber Association at New York. Duplicate sets of such Official Type Samples may be established in such manner and at such places from time to time as the Rubber Association shall determine. Said samples may be renewed or revised at the discretion of the Rubber Association, but in event of any change in quality the original type samples shall be kept on file. Each Official Type Sample shall bear the date of its adoption, and the type sample bearing the nearest date next before the date of contract shall govern.

(b) All rubber not covered by these Official Type Samples shall be treated as specific lots under these Rules and Regulations.

(c) The quality of all deliveries shall be subject to Buyer's inspection.

2. The word "Ton" shall mean a ton of 2240 pounds.

3. The total quantity delivered under any contract shall be within the average weight of one case of the kind of rubber covered by said contract, unless the words "about," or "more or less" have been used to define quantity, in which case Rule 4 shall apply.

4. The words "about," or "more or less" when used to define quantity contracted for, shall mean the nearest amount which Seller can reasonably deliver, but no excess or deficiency shall be greater than 2½% of quantity for which contract is made.

5. (a) A contract calling "for delivery" shall be construed to mean that the rubber shall be ready for delivery to Buyer at the place and within the period stipulated in the contract.

(b) A contract calling "for arrival" shall be construed to mean that the rubber shall arrive upon a vessel at the port named within the period stipulated in the contract and shall be tendered or shipped as soon thereafter as conditions will permit.

(c) A contract calling "for shipment" from a specified country or port shall be construed to mean that the date of the bill of lading at such port of shipment shall be within the period stipulated in the contract.

6. When rubber is sold "for shipment" from a definite point, Seller may tender in fulfillment of the contract rubber not coming from that point, provided, however, that such rubber is of the same description and quality as the rubber specified in the contract and provided further that it is shipped in time to reach Buyer within the period contemplated by the contract and that transportation cost, if for the account of Buyer, is not increased.

7. Under a contract specifying rubber "for arrival" and/or "delivery" during a specific month, Seller shall advise Buyer on or before the last working day of that month the position of the rubber so contracted for, and under a contract specifying rubber "for shipment" during a specific month, Seller shall advise Buyer as to the position of the rubber so contracted for as soon as such information is available to Seller, but in any event on or before the fifth day of the month following the month specified "for shipment."

8. The term "prompt shipment" shall be construed to mean—Shipment within a period of—

(a) Five (5) days, if shipped from any place within the Continental United States.

(b) Ten (10) days, if shipped from Mexico or Central America.

(c) Fifteen (15) days, if shipped from Great Britain or from Continental Europe.

(d) Twenty (20) days, if shipped from South America.

(e) Thirty (30) days, if shipped from Africa or the Far East.

9. When a contract provides for monthly portions, each monthly portion shall be treated as a separate contract.

10. Any import duty or tax imposed by the United States or Canadian Governments on crude rubber shall be for the account of Buyer.

11. The term "Spot Rubber" shall be construed to mean rubber which is ready for movement by rail, truck, lighter or steamer within 48 hours from time of contract.

12. If final weights fall within ⅛% more or less than invoiced weights, payments shall be made on the basis of invoiced weights. If final weights vary from invoiced weights by more than ⅛%, payments shall be made on the basis of actual final weights, or if the invoices in question have beeen paid, adjustment shall be made by debit or credit for the full difference between invoiced and final weights within thirty days following receipt of the rubber at the point of final weights stipulated in the contract.

13. All rubber must be accepted or rejected by the Buyer within five (5) days after receipt at point of inspection, as specified in the Contract, unless Factory of Buyer is specified as point of inspection, in which case ten (10) days shall be allowed.

14. Obliteration or destruction of package marks during inspection shall not prejudice the rights of either Buyer or Seller.

15. (a) In the event that Buyer shall reject all or any part of a tender of rubber, on the grounds that the quantity rejected is not of the quality or type specified in the contract, Buyer shall notify Seller of such rejection by sending to his business address within forty-eight hours thereafter, notice by telephone or telegram, such notice to be immediately confirmed by letter.

(b) Promptly upon receipt of such notice of rejection Seller shall take steps to verify the correctness thereof, and if Seller agrees to the rejection, he shall be required to deliver to Buyer on or before the fifth day following the notice of rejection or on or before the last day allowed for delivery in the contract, whichever is later, an amount of rubber equal in quantity to that rejected and of the quality or type specified in the contract and further, shall give Buyer shipping directions with reference to the rubber rejected unless Buyer shall have signified his willingness to accept a price allowance and shall have agreed to the amount of such price allowance in lieu of requiring replacement delivery. The place of delivery for a replacement shall be the point in the Continental United States from which the original shipment was made, or, a point no farther away from Buyer's Plant than such original shipping point.

(c) In the event that Seller fails to agree to such rejection, arbitration may be resorted to under Rule 19 hereof, and if said arbitration is decided against Seller, Seller shall be allowed five (5) days after such arbitrator's decision or on or before the last day allowed for delivery in the contract, whichever is later, in which to make replacement delivery to Buyer of an amount of rubber equal in quantity to that rejected and of the quality or type specified in the contract.

(d) If such rejection and replacement thereof is agreed to by Seller or is decided in Buyer's favor by arbitration, Buyer's cost of receiving, handling, sorting, inspecting and reshipping of the rubber rejected shall be for the account of Seller.

16. (a) Whenever it is admitted by Seller that Seller has failed to fulfill the terms and conditions of a contract, or in the event that Seller shall have failed promptly to adjust or replace a rejection under the provisions of Rules 15 (b) or 15 (c) hereof, Buyer may, at his option, fix a washout price applying to that portion of the contract involved by such failure either by agree-

ment with Seller or by purchasing in the open market an amount of rubber equal in quantity to that involved by such failure and of the quality or type specified in the contract.

(b) Whenever a question of failure of Seller to fulfill the terms and conditions of a contract is submitted to arbitration under Rule 19 hereof and the arbitrators decide that such failure has occurred, they shall also fix a washout price on the basis of the current market applying to that portion of contract involved by such failure, unless the arbitration shall have been requested and decided against Seller under the provisions of Rule 15 (c) hereof, in which case if Seller fails to make replacement delivery as provided therein, a washout price shall be fixed in accordance with the provisions of Rule 16 (a) hereof.

(c) The difference between the contract price and any other price fixed under Rules 16 (a) and (b) hereof shall be adjusted by debiting or crediting Seller, and Seller shall be charged one-half cent per pound for failure to fulfill that portion of the contract.

17. (a) Whenever it is admitted by Buyer that Buyer has failed to fulfill the terms and conditions of a contract, Seller may, by agreement with Buyer, fix a washout price on the basis of the current market applying to that portion of the contract involved by such failure, or upon failure of agreement between the parties, a washout price on the basis of the current market and applying to such portion of the contract shall be fixed by arbitration under Rule 19 hereof.

(b) Whenever a question of failure of Buyer to fulfill the terms and conditions of a contract is submitted to arbitration under Rule 19 hereof and the arbitrators decide that such failure has occurred, they shall also fix a washout price on the basis of the current market applying to that portion of the contract involved by such failure.

(c) The difference between the contract price and the washout price as determined by agreement between the parties or by arbitration, shall be adjusted by debiting or crediting Buyer and Buyer shall be charged one-half cent per pound for failure to fulfill that portion of the contract.

18. In the event that either Buyer or Seller should fail to fulfill the terms of a contract with respect to any portion thereof, by reason of insolvency or its equivalent, the party so defaulting shall immediately be deemed to be in default on all other unfulfilled portions of such contract and adjustments shall be made in accordance with provisions of Rules 16 and 17 hereof.

19. In case Buyer and Seller fail to agree upon settlement of any dispute arising out of a contract made under these Rules and Regulations, the dispute, at the request of either party, may be submitted to arbitration. The party requesting arbitration shall make such request in writing to the other party to the contract and also to the General Manager of the Rubber Association. Within three days from the time that either party shall request arbitration, each shall appoint his arbitrator and these two arbitrators shall within forty-eight hours following their appointment jointly select a third arbitrator. Upon failure of the first two arbitrators to agree upon a third arbitrator, the third arbitrator shall be appointed within twenty-four hours by the General Manager of the Rubber Association, or in his absence, by an official of the Rubber Association, whom he shall designate to act in such cases and whose name will be on file in the office of the Rubber Association. All arbitrators' decisions shall be made in writing to the General Manager of the Rubber Association and by him shall be promptly released to the parties concerned. Each decision reached and submitted, as provided herein, by a majority of the arbitrators, shall be final and binding upon both parties and the cost of each such arbitration shall be for the account of the party against whom the arbitration is decided.

Each arbitrator shall receive a fee of $10 for each arbitration.

20. All contracts made under these Rules and Regulations are subject to Government interference, acts of war, marine disasters, force majeure or other causes and contingencies beyond either party's control.

Long Curing for Rubber Thread

That one of the purest of soft rubber products, thread and tape used for elastic webbing, for the wound cores of golf balls, etc., should require such a long period of vulcanizing as from 5 to 5½ hours may seem odd to even some rubber men who see an inner tube molded and cured in 6 minutes, or a highly-compounded stock cured in 15 minutes with 80 pounds of steam. Yet long curing has proved to be essential for rubber thread, and efforts to hasten the process with accelerators do not appear to avail much. Old manufacturers of rubber thread are as particular about their rubber as about their curing, preferring hard cure fine Pará even to choice plantation rubber, claiming that the former stands up better under severe working, although finding some good results in blending the Brazilian fine crude with selected plantation smoked sheet.

The thread is practically pure rubber, having about 5 pounds of fine sulphur in a 50 pound rubber batch, and often a small percentage of refined balata to add strength and to facilitate handling in the processes. Extreme care is taken in milling, and ample time is also allowed for nerve recovery between each operation from mastication to vulcanization. In effecting the curing the sheeted stock is wound about a drum, each layer being separated with wrapping cloth fed from a roll, and the drum thus laden is steeped in water which is gradually raised to and maintained at vulcanization temperature. Hot water is preferred to steam for giving a more uniform cure. The sheets are cut into strips or threads by circular knives on a mandrel or cylinder. In a new Continental process it is said that very good round thread is now being made with an extruder, the product being favored for webbing.

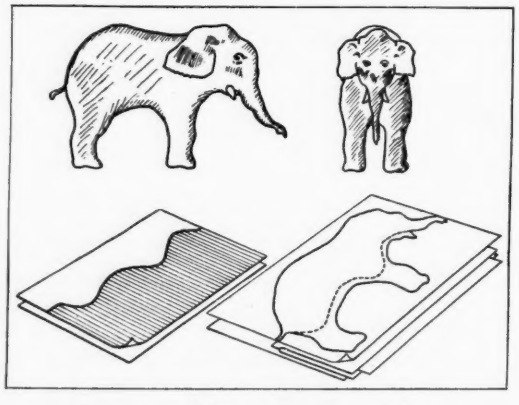
Inflatable Toys

A New System of Making Pure Gum Goods by the Cut-Seam Process

INFLATABLE balloon-like toys possess far greater interest for children than the non-inflatable molded types. The blanks for molded toys are always stamped out from two sheets of rubber and in the case of making four-footed animals the legs on opposite sides require to be forced into separate parallel planes. This frequently makes folds in the stock at the shoulders or hips and causes seconds by making mold cracks in the goods. The many limitations of these old-style toys disappear with the invention of the newest process of rubber toy making in which no molds are needed and less rubber is used. Moreover, objects of greater degree of interest and amusement are produced because of their capability of being blown up to grotesque shape yet stand upon their feet.

The manufacturing process, which is of European invention[1], is outlined as follows: The profile of an intermediate body portion of a figure is stamped out from superimposed plates of rubber so that they adhere along the profile. In other words, the plates are cut-seamed along profile lines. These joined plates are then employed as an insert between two other plates and the entire outline of the figure is stamp-welded or cut-seamed from all the superimposed plates.

When the stamping operation is completed and before inflation, the form thus produced presents two outer layers forming the flat sides of the figure in its deflated condition. The two inner layers of the insert are united to the outer layers along a marginal edge of the outer layers. They are also united together inwardly



Method of Making a Cut-Seamed Toy

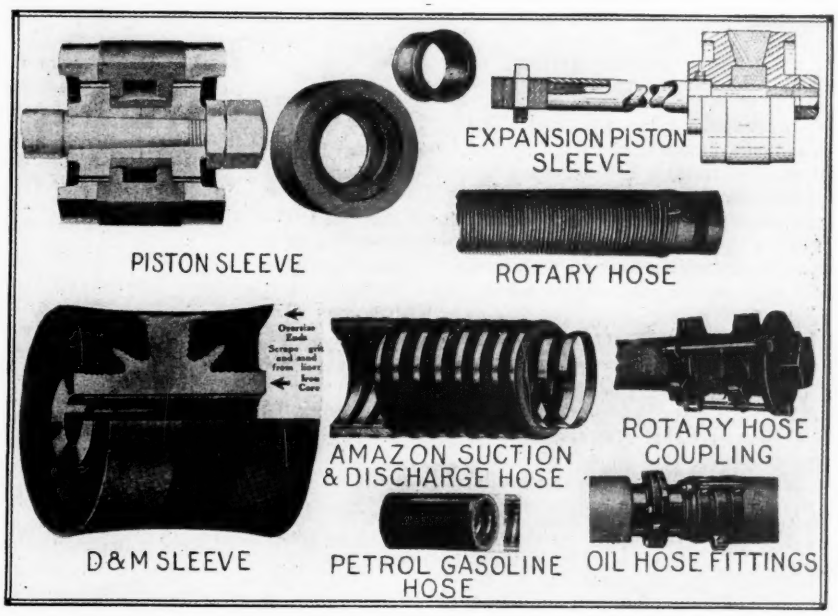
of that marginal edge in a line corresponding to the profile along which they were cut-seamed together.

Thus, for example, a body in human form may be produced possessing profiles of face, torso, and back as well as legs and arms. It is evident that this system offers marked advantages of economy over the old molding process and an unlimited range in variety of product.

[1] U. S. Patent No. 1,697,459, Jan. 1, 1929.

Rubber in Oil Production

Hard and Soft Rubber Packing— Rotary Drill Hose— Hard Service Rubber Belting— Suction and Discharge Hose— Rubber in Pipe Couplings— Other Oil Field Accessories



PUMPING in oil fields presents problems very unlike those met with elsewhere; and while ordinary water pumps serve their purpose well with the plain disk rubber piston packing familiar for about 70 years, pumps for oil wells require for their hard service rubber piston packing in the form of hubs and sleeves, often of a unique and ingenious type. After a well has been bored and the heavy outer or casing pipe has been set in place, the pump tubing is inserted and the hole is freed of its accumulation of water, sand, gravel, mud, rock drillings, and perhaps oil. In cleansing the cavity a pump must sometimes contend with gas or oil pressures up to 1,800 pounds per square inch.

To deal with such adverse conditions operators employ extremely tough, hollow rubber piston sleeves which by automatically expanding keep the cylinder liners perfectly swabbed and yet prevent sand from passing between piston and liner, as well as having the advantage of expanding as fast as the rubber wears.

On one style of piston, between the head and the follower, the rubber sleeve is recessed to admit water to distend it and shows in cross section a somewhat flattened E-shape. The rubber weighs from ¾ pound for a 4-inch to 2⅞ pounds for a 7¼-inch pump. For exceptionally rough service one type of piston has a double (2-section) rubber center, the inner and smaller element, a rubber hub packer, having low, flat flanges at either end against which rest higher inset flanges on the outer and larger rubber sleeve. Such a double packing is claimed to insure not only against cylinder but also core leakage.

Another heavy duty expansion piston type employs two solid rubber rings, the inner or hub rubber being a thick, flat cylindrical section, and the outer ring set against it resembling a washer bevelled to the center.

Uses Hard and Soft Rubber

An automatic expansion packing element much used on pistons in oil field pumps is about four inches long and four inches wide of soft, tough rubber, vulcanized to a hard rubber coating on the steel carrier. It has oversize ends and a slight concavity in its side or circumference. It has ports at top and bottom which admit fluid to expand the rubber and to provide maximum suction or compression, and also keep the liner free of grit.

Another piston type outwardly resembling the foregoing is unique in using three kinds of rubber: hard rubber vulcanized on the core, which projects outward to strengthen the center; a soft, cushion rubber forming the body of the piston; and a band of whalite, a tough, fibrous, rubber-like composition, as a reinforcing center band.

Two hollow rubber sleeves showing an outer convex form in cross section are used on the piston of a well known slush pump. They are held in place by three metal sleeves and provision is made for fluid to enter the rubber sleeves to obtain the utmost suction with minimum core leakage.

Much piston packing for the mud end of slush pumps is made simply of soft, pliable duck and tough rubber built up as thick, slitted washers, the plies being laid crosswise, diagonally, or in fanset formation.

It has been remarked that among the many rubber stocks provided for meeting the very trying conditions to which slush pump piston packing is subjected there is comparatively little variance in tensile strength, usually extending from 4,000 to 4,500 per square inch, and yet the stiffness modulus may range from 22 to 31 or 38. All makes are good for certain needs. Manufacturers are rarely hampered with customers' specifications and such leeway usually develops the best formulas.

Rubber Saves in Crooked Drilling

The use of rubber for packers and for safeguarding tools in well drilling is without doubt too well known to be mentioned here, but it is said to be also valuable for reducing the grating between drill pipe and casing. While the drill-tipped pipe string is being whirled in the casing by the rotary it often grinds hard on the casing or its joints. In short, straight holes, this may not mean much, but where the holes are several thousand feet deep with numerous lengths of casing, the lessening of friction on casing and drilling string becomes important. Few well holes are quite plumb. In many the bottom may be 150 feet away from the top, and in the

case of the 8,200-foot Olinda (California) test well the drilling string was found to have fairly described a circle.

To overcome such grinding, as well as to conserve boiler power, avert casing collapse, and prevent water leaks, an anti-friction tool joint and drill pipe collar has been devised. It consists of a flat, tough rubber band, bevelled at either edge, and mounted on a metal collar carrying ball-bearings. Power saving as high as 50 per cent has been effected, it is said, with such a rubber contrivance.

Well Cementing Requires Rubber

To exclude water and gas, as well as to fortify well casing, the space about the latter has to be filled. This is often done by flowing mud into the opening, but as the mud may be kept soft in water-bearing strata, or be made porous by gas under high pressure, the radical remedy is cementing. This is effected by forcing neat cement down through the casing until it rises to a sufficient height outside; or by making a water shut-off in which a wooden plug is inserted in the casing, covered with a short column of cement, topped with another plug, and the whole forced down. To each plug is affixed a heavy rubber-canvas disk to hold the cement in place, as well as a heavy column of water above.

In some cases water is shut off by running cement into the casing and following this with a rubber ball having a specific gravity light enough to float above the cement but which will remain below the mud or water pressing down through the casing.

Rotary Hose a Valuable Adjunct

Extremely important in oil field operations is rotary drill hose, a flexible tubing designed for the roughest service. In the rotary boring process the bit attached to a string of hydraulic piping is kept cool by forcing slush or muddy water by means of a rotary hose into the upper part of the swivel suspended above the well hole and down the revolvable inner stem into the piping below. In addition to keeping the bit cool, the slush is forced up on the outside of the casing and the well wall is often quite completely plastered. Excess fluid, usually carrying much grit, runs out at the top and into a tank from which it is pumped back into the well. Cement is also forced into wells with rotary hose to close up the space between the casing and the earth or to effect a water shut-off.

Rotary hose is usually made of either extra heavy rubberized duck or a special cord fabric in five to eight plies and reinforced ends in seven to eight plies, and has a very tough rubber lining. In some types a heavy outer braid of cord strengthens it against internal pressure while leaving the hose quite flexible, but in most types it is spiralled with strong galvanized wire within and without to guard it not only from bursting from within but also from collapsing under vacuum. On some types the armor is wound about the hose after it has been vulcanized, on others it is vulcanized into the fabric. An unarmored hose having a very durable and smooth rubber cover is also much used. Internal sizes of rotary hose range usually between two and three inches, with lengths varying from twenty to thirty feet.

As slush pump pressures were increased from 800 to sometimes 1,500 pounds much trouble was experienced with rotary hose couplings blowing off. Now they are quite securely affixed by screwing them on to nipples or the threaded ends of short sections of pipe upon which the hose is built and to which wire armor is anchored; or the coupling is clamped on the hose and the armor wire soldered or welded to the coupling; or the coupling is not only clamped on the hose but strips of rubberized fabric are caught up in the clamp bolts and the coupling fairly vulcanized on to the hose. See rotary hose coupling in the illustration. One type of hose thus fitted is said to withstand 2,000 pounds.

Hard Service Rubber Belting

Outside the refineries, in which rubber is more or less taboo because of the harm which may be done the material by much heat and high solvents, rubber belting is prized by oil workers for the qualities that have popularized it in so many industries. It finds considerable use on well rigs of either the portable or the fixed derrick type and rubber belts in the fields are said to stand punishment that leather belts could not endure. Except for a few light mechanical operations, where only narrow, very pliable bands can be used, the rubber belting is made of well-frictioned hard-woven duck, the plies ranging from two to nine or more, and widths up to 60 inches. Such construction insures much flexibility and great strength and a specially tough rubber cover saves the belt from the action of oil, etc.

One specially made rubber belt is seven-ply, 12 inches wide, very flexible, is square-edged, sealed against oil, and has no folds to start any "bootlegging." Instead of being laced, spliced, or riveted, the ends are slightly upturned and joined with short bolts reinforced with narrow angle-iron plates. In some types a special layer of rubber is put between the plies, in addition to the friction, to enhance transmission efficiency.

Suction and Discharge Hose

For conveying crude oil or refined fluid products from stationary tanks to railroad cars or delivery trucks, or for loading or unloading sea-going vessels, rubber suction and discharge hose is a great essential. It is the heaviest and strongest hose made for any purpose and is designed to withstand not only high pumping pressure but also severe external tension, as where used on long, submerged lines or on pontoon connections subjected to much wave strain. The hose for light unloading service may be built with a spiralled flat wire inside, a solid or cabled wire in the wall, and the outside left smooth. But for heavier work it is usually made with a wire coil inside and one inlaid on the outside, while for extreme service the hose is provided with three wire spirals, in the core, in the wall, and on the outside. These types include both rough and smooth bores. Wire reinforcement checks both bursting from internal pressure in discharging oil cargoes or external pressure when in suction service. Not only is the extra heavy duck in the plies filled with oil-resisting friction rubber, but the tube and cover are also made of a rubber compound on which oil has practically no effect. Internal diameters range from ¾-inch to 20 inches. One type of discharge hose has 8 plies, smooth core, midway rubber jacket, and a smooth cover.

Gasoline hose, for light delivery service, is also made of plies of strong duck frictioned and coated with rubber made as resistant as possible to petroleum solvents, and is supplied largely in three types: rough bore with inner and outer spiralled wire; smooth bore with molded outer wall; and smooth bore with cotton jacket, with or without wire armor. Sizes range from ½-inch to 2½ inches with 3 plies, or 4 plies for larger diameters. Most of the hose is made according to fire insurance underwriters' specifications, and lengths vary from 8 to 50 feet. See petrol gasoline hose in the group picture.

Other Oil Field Accessories

To avert blowing out of wells and to control possible gushers, rubber bearing blowout preventers are extensively used. One type which has either a single or double rubber packing element is clamped on the drilling pipe and depends upon the weight of the latter with that of the column of slush pumped into it through the rotary hose to shut off the top of the well; and it rarely fails to hold down all gas and oil, even under high upward pressure, until the well is completed.

Leakage of water or slush in the swivel hung above the rotary drill is prevented by using in the revolving stuffing box a heavy soft rubber packing. One type of the latter is somewhat spool-shaped and has ports in the lower part to allow injected fluid to enter and make an effective core and upper and lower seal.

A casing oil saver for conserving oil where a heavy flow would leak from a well while placing casing pipe has two rubber elements in a frame clamped about the casing string.

Another oil-saving device consists of a pair of small rubber wheels concaved like pulleys and set at either side of a pump rod, which is also wiped clean by the impressed hollow wheels. Some drilling lines are equipped with even more unique rubber oil savers and wipers.

Rubber Hat Bags

Hat Bag Stocks—Calendering—Curing Other Rubber Articles for Hat Work

J. J. DAWSON

THE costly equipment and careful research necessary to produce the various rubber articles used in conjunction with hat manufacturing make it prohibitive for any but those who have featured this work since its inception to meet the high standards required.

A hat bag is a molded high-grade rubber diaphragm resembling in form a hat having a relatively small crown and broad flat rim. The thickness of the walls of hat bags is usually about ⅜-inch and the composition very tough and elastic to admit expansion under high pressure, either air or water, and give final shape to the hat.

Owing to the peculiar operation performed by the rubber hat bag, care is extremely necessary in the compounding of stocks for this work. All materials must be carefully selected and particular attention must be given to the removal of all foreign-matter impurities. The slightest and most minute foreign or gritty particles appearing in the finished stock will cause either a blowhole or rupture which will completely ruin the bag. Consequently minerals must be bolted, all reclaims, when used, and they can usually be used with safety and satisfactory results, must be screened, and the finished stock after milling, must be screened before being calendered. Wooden storage racks for raw stock are out of the question owing to the ever present danger of splinters and small pieces of wood becoming embedded in the stock.

New York Belting & Packing Co.

Hat Bag Stocks

The following hat bag compositions are practical although to be strictly up to date such stocks should contain some organic accelerator and antioxidant. A truck tire tube stock would be excellent for the purpose.

The stock required should have a high tensile strength, a stretch of at least one to five with little or no permanent elongation. A characteristic compound having these qualities would be made up as follows:

Smoked sheets	36
Barytes	32
Litharge	18
Sulphur	8
Lime	6
	100

It will be noted that there are considerable curing agents to compensate for the heavy filler used. This stock, though apparently somewhat loaded, has another and perhaps unnoticed quality. Hat bags are sold by weight and, though the volume cost is low, the finished article commands a higher sale price, consequently the heavier stock gives the manufacturer additional sales value.

Another practical stock in which the use of reclaimed rubber is a feature is as follows:

Smoked sheets	20
High tensile reclaim	45
Barytes	17
Litharge	10
Sulphur	5
Lime	3
	100

There is no technical process used in the compounding and milling of the stock that differs in any respect from methods in common use for all rubber compounds, with the exception of the care to be used in precluding dirt and foreign materials, the screening of the reclaimed rubbers, and, of course, the washing and drying of the raw rubbers.

Calendering

The stock should be allowed to recuperate two to three days after milling. It is then warmed for sheeting on the calenders to the desired thickness. The calender operation must be performed carefully. Hat bags range from 3/16- to ¼-inch thick, but the stock should not be run on the calender to this thickness in a single ply but rather should be plied up 1/32-inch at a time until the desired thickness is attained.

The reason for the use of this method is to obviate the possibility of weakness in the finished product. All rubber has a distinct grain the same as wood, that is, the tenacity of the fibers extends in one direction. By plying the stock on the calender to the desired thickness the several plies would have the grain extending in opposite directions or crossing each other. When cured the finished product would present little possibility of rupture.

Curing

Hat bags are cured in molds, a choice of two methods being used. Two-part molds are the usual equipment, the molds being made of aluminum, the bottom half skeletonized in the center while the top half is skeletonized around the rim. This is done to eliminate weight owing to the large diameter of the molds and also to present a greater bearing

surface against the platens of the press. Solid iron molds of the bolted type are sometimes used and the bags are cured in a vulcanizer thus giving equal heat at all points on the mold. Here is another reason for the use of the curing agents so prevalent in the suggested compounds. The cure used in the manufacture of hat bags usually runs from 12 minutes for the 3/16-inch bag to 14 minutes for the ¼-inch bag at 290° F. Incidentally this is the correct cure for both of the stocks previously mentioned in this article.

When the bags are cured they are removed from the molds, trimmed, tested, and inspected, and packed for shipment. Finished bags are only carried in stock in small quantities owing to their quick deterioration when not in use. The hat manufacturer formerly kept his surplus stock under water until actually needed for use. This, of course, is no longer necessary where the material is protected against deterioration by any of the excellent antioxidants now available for that purpose.

Hat Bag Sheet Stock

Some hat manufacturers make their own bags from purchased raw stock. The stock is prepared in essentially the same manner as previously described in the manufacture of the bags except that instead of plying it to the full thickness, namely, 3/16 or ¼-inch, it is usually furnished ⅛-inch thick plied and run on hollands sheeting and cut in sheets 8 by 10 inches. This is a very convenient size sheet and cuts to good advantage to fit the irregularities and curves of the molds. The raw stock is built up in the mold in such a manner as to preclude the grain from running in a single direction, the plies being laid in opposite directions.

Tippets

Hat manufacturers usually carry a full equipment of molds for the curing of the tippets, together with a small single platen press. This article is manufactured direct because its size and contour are dependent upon the style of hat and its crown design. Special manufacturing processes also enter into consideration. The raw stock is purchased in sheets from a rubber manufacturer and the tippets cured up as needed. This stock is considerably harder than that used for the bags, usually about the same as a medium hard valve stock. A suggested compound curing at 300° F., 14 minutes for ¼-inch thick, 17 minutes for ⅜-inch thick and 20 minutes for ½-inch thick, is as follows:

Smoked sheets	24
Zinc oxide	46
Fossil flour	18
Light calcined magnesia	8
Sulphur	4
	100

The tippet is placed inside the hat, before the bag is let down into the crown of the hat. Its purpose is to protect the surface of the bag from extreme bending and to offer a less yielding surface at the point of greatest pressure, the edge of the crown.

The Rubber Tolliker

The rubber tolliker may be manufactured in two ways, either cured in a mold or cut from a slab. The latter method is not so satisfactory as the former because of the possibility of distortion and uneven cutting, owing to the extreme thickness required in such a slab.

The compound used has about the same general characteristics as that used for port hole rubber, squilgee, etc. A very practical method is to use a three-part multiple-cavity mold, running the stock on a tubing machine and cutting it to the length of the cavities.

A suggested compound, curing at 290° F., 36 minutes for 1½-inch thick and 41 minutes for 2-inch thick, follows:

Smoked sheets	12
High tensile reclaim	37
Pure gum scrap	24
Lt. calcined magnesia	6
Sublimed lead	6
Chalk whiting	12
Sulphur	3
	100

The above stock will flow freely in a mold and lends itself readily to the tubing machine operation.

Other Rubber Articles for Hat Work

The rubber bands and protective coverings used in the hat repair business and by cleaners are built up on mandrels wrapped and cured in a vulcanizer. When cured they are cut on a lathe and stripped. Here a very elastic stock is required similar to the compounds used in rubber bands.

Weatherproof hat covers are made by manufacturers equipped to produce sheeting, raincoats, proofing, flat work, etc. Different grades require different processes. Some are cured in presses the same as cloth inserted sheet packing, while others are cured under a low temperature in an open heat (or oven in this particular case) the same as auto top material, carriage cloth, etc.

When the roll of material is cured it is cut into the desired shapes and sizes and tailored as are clothing and raincoats.

Hat manufacturers' rubber supplies are thus seen to be, on the whole, high grade material made to resist strenuous service in hydraulic processing of hats, as to shapes of crowns and rims. In fact the hat makers production is vitally dependent on the dependability of the service he gets from his bags and bag repair stock. They are as vital to the production operation of his shaping machines as tires and inner tubes are to automobile service.

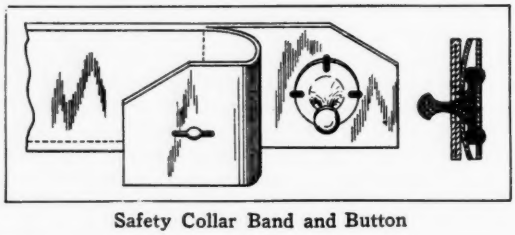
Rubber Collar Buttons

The never ending search for new uses for rubber is unlimited in scope. A recent useful application is one offered as a personal convenience to men. It is none other than a collar band for shirts wherein front and rear rubber collar buttons are attached. Its construction is such that the front and rear collar buttons are prevented from coming in contact with the neck of the wearer.

The buttons are made of soft rubber and permanently attached so that the band may be laundered without necessitating their removal. Neither can the buttons or band be injured by the buttons remaining in the band during the laundering process.

The mechanical construction of this combination is indicated in the illustration which pictures one end of the band in elevation showing the attached button in position and with the protecting flaps turned back. A sectional view shows the pocketed button in position for receiving the collar.

The inventor has successfully eliminated those petty and sometimes exasperating annoyances, the periodic transfer of collar buttons from shirt to shirt and the frequent misplacement or loss of the collar buttons.—U. S. Patent No. 1,696,450.



Safety Collar Band and Button

Rubber Division A.C.S.

New York Group

THE first in the 1929 series of the New York Group meetings was held Wednesday, March 20, at the Town Hall Club, 123 W. 43d St., New York, N. Y. Preceding the program of papers, a turkey dinner was served to the company which numbered nearly 200, and included visitors representing the Boston and Akron groups.

A quartet was present from the laboratory of the Manhattan Rubber Mfg. Co., Passaic, N. J., composed of the following members: Charles Lent, first tenor; J. E. Skane, second tenor; K. J. Soule, baritone; G. L. Hassert, bass.

They contributed greatly to enliven the occasion by rendering several humorous numbers. The topical song references to Chairman Wiegand, R. P. Dinsmore, and H. L. Fisher were keenly appreciated.

All present joined with evident pleasure in singing several New York Group songs specially written by W. H. Whitcomb, United States Rubber Co., New Haven, Conn.

Preceding the program of papers, Chairman Wiegand referred briefly to the organization a year ago of the four rubber groups and stressed the significance of the group idea. His remarks were in part as follows:

The Group Idea

"Your Chairman and your Executive Committee greet you and thank you for turning out so splendidly tonight at this first meeting of the New York Group for 1929. We consider that your turning up in such numbers is a gesture of loyalty and fealty to your Group, and I am going to ask you for a moment to consider with me whether or not that loyalty is justified.

"I suppose most of you here are members of the American Chemical Society. That gives you headquarters from a professional point of view in a body of very large membership but you are one among 10,000 members. The A. C. S. meets sometimes in New York, sometimes in Chicago, and sometimes elsewhere. It wanders hither and thither, and that puts a natural limit on the character of the loyalty that anyone can develop for such an organization.

"The next body to which most of you belong is the Rubber Division. This is a smaller group, consisting of only 500 or 600 people. Nevertheless it, too, is a peripatetic body, and it is true that the Rubber Division provides for you what we may call the headquarters for the industry.

"In the group idea you have something that is permanent, that is local, that has a house and a place where you can hang your hat. No other division of the chemical activity in America supplies this particular want so well as the group idea."

The chairman humorously compared the local characteristics of the different rubber groups much to the amusement of his hearers and concluded, "Now, gentlemen, you see where this brings us. It brings us here to little old New York and our own group. That is why we take your presence here tonight as a real appreciation of the loyalty of the New York Group and what it means."

Symposium on Stearic Acid

This symposium comprised the following papers covering the discovery of the value of the material in curing rubber, its manufacture and its effects from various points of view. The abstracts of these papers follow in the order read.

EARLY EXPERIMENTS WITH STEARIC ACID. The author described the variable behavior of plantation and other rubbers in technical vulcanization and outlined the theoretical considerations and research which led him in 1921 to draw the conclusions enumerated below.

(1.) Crude rubber is very variable in its reaction to zinc oxide on vulcanization and may be classified as (a) responsive to zinc oxide, (b) intermediately responsive, (c) unresponsive. (2.) Responsive rubber yields an extract which consists for the most part of organic acids, resembling the higher fatty acids and actually containing a notable proportion of stearic acid. Unresponsive rubber is practically devoid of active organic acids. (3.) The organic acids in responsive rubber are the cause of the superior technical curing quality of the rubber, due to their power, in conjunction with basic substances or nitrogenous accelerators, of bringing zinc oxide into a state of solution in the rubber during vulcanization. The lack of organic acids in unresponsive rubber is the cause of the imperfect curing properties of such rubber, due to the fact that the zinc oxide remains undissolved. (4.) Addition of a fatty acid to unresponsive rubber corrects the defect in the rubber due to the absence of natural organic acids and puts the rubber on the same curing plane as responsive rubber, particularly when nitrogenous accelerators are used.

It is thus possible by adding a constant proportion of fatty acid to all rubber to maintain a high degree of uniformity of cure for any given formula, irrespective of the natural variation of the raw rubber.—W. F. Russell.

THE NATURE, MANUFACTURE AND GENERAL USE OF STEARIC ACID. Stearic acid occurs as the tri-glycerid, the source of which is animal tallow. Commercial grades are designated as single, double, and triple pressed, and the single pressed which is composed of approximately 85 per cent stearic acid and 15 per cent oleic acid has become the standard of the rubber industry.

Distillation is included when dark greases are employed as raw material, but usually the stock is not distilled after saponification when light colored tallows are used.

For rubber, stearic acid should be free from non-fatty acid material and the oleic acid content restricted since that component induces bloom in certain stocks if present in excessive quantity. Melting point, iodine absorption, and percentage of free fatty acid determine the suitability for rubber.

Because of expansion a decade ago, manufacturing capacity in this country is in the neighborhood of 100,000,000 pounds. Last year, the rubber industry consumed about 12,000,000 which was 30 per cent of total production. Prices, which now are not relatively high, are directly dependent on the tallow market and closely follow it since raw material is the important item in manufacturing cost. The specific gravity of stearic acid is 0.85 which is without exception lower than that of any other important rubber ingredient. Its volume cost at present levels is little more than one-half that of crude rubber.—D. F. Cranor.

EFFECT OF STEARIC ACID ON VARIOUS CRUDE RUBBERS. It is recognized that the addition of stearic acid to rubber compounds affects the results obtained with different accelerators to varying extent. Russell and also Whitby have shown that the resins that occur in crude rubber consist in great part of fatty organic acids and that the amount of such fatty acid varies quite appreciably for different rubbers.

It is now shown that in determining the effect of adding stearic acid to any rubber compound the amount of fatty acid present in the crude rubber used must also be considered. If this naturally occurring fatty acid is taken account of, there is evidence that the exact acid content of a compound has an important effect on the physical properties secured with it. Furthermore, there is probably a definite state of acidity for each accelerator, and perhaps compound, which gives the best results with the combination in question.—E. W. Fuller.

Effect of Stearic Acid on Organic Accelerators. Apparent anomalies have been noted in the effect on the same accelerator. The presence of oleic acid causes loss of modulus. Pure stearic acid is best for high modulus stocks such as tire treads. The less pure single press is suitable for stocks of low modulus such as frictions more or less compounded. Stearic acid is a retarder of chemical and physical cure.—R. P. Dinsmore.

Some Theoretical Aspects of the Wetting Action of Stearic Acid. Thirty per cent by volume on the rubber is about the limit for perfect dispersion of carbon black in a tread stock. It is figured that to effect this dispersion 1.95 per cent of fatty acid is required on theoretical grounds. The filler is wet by the stearic acid and not by the rubber. A method was described for determining the molecular cohesion between stearic acid, fillers and rubber in connection with the author's theory of dispersion of fillers in rubber.—J. T. Blake.

Effect of Stearic Acid on Reclaimed Rubber. Softeners are indispensable to the reclaimer for use in economically plasticizing vulcanized rubber scrap. Softeners may be used in contact with the vulcanized scrap during the heating operation to speed up plasticization. Or they may be added on the warm-up mill or in an internal mixer prior to refining to facilitate addition of a pigment to control tackiness, or to impart certain working properties and consistency.

In the alkali process of reclaiming, stearic acid forms a soap and does not function as a softener. Stearic acid functions as a softener in processes in which no alkali is used. When added to a reclaim on the mill, without addition of other pigment, or with addition of whiting, clay, or carbon black, stearic acid gives a more plastic reclaim which cures up to give higher tensile and higher modulus.

The addition of stearic acid produces more plastic reclaims without increase in tackiness. Plasticity and recovery measurements indicate reduced nerve. Stearic acid added in a reclaim is equivalent to the same percentage added in a rubber compound for activation purposes. It improves molding and curing properties and shows less tendency toward reversion than other softeners.—H. A. Winkelmann and E. B. Busenburg.

Stearic Acid in Litharge Compounds. In these stocks litharge acts an an accelerator and that addition of stearic acid is needed to activate the litharge was demonstrated by work reported. Captax stocks do not require the presence of stearic acid for accelerator activation.—J. R. Sheppard.

Effect of Progressive Additions of Stearic Acid on the Abrasive Index. The effects on abrasive index, modulus at 300 per cent elongation and tensile strength were compared in a carbon black tread stock accelerated with Tuads cured 30 minutes at 259° F. The range of stearic acid and paraffin additions was from 0.5 per cent to 30 per cent. Abrasive index determined by the Grasselli machine showed the index declines with increase of stearic acid from 0.3 per cent to 10 per cent, the drop being from 218 to 160. The index is the same at 15 per cent. As the stearic acid content rises to 30 per cent the index becomes 190. In the case of paraffin the drop off in the index is rapid up to 20 per cent of paraffin where it is 125 and becomes 140 with 30 per cent paraffin.

Similar parallel relationships were found in the effects of the two materials on modulus at 300 and tensile strength. Both suffer a rapid decline as the percentages of stearic acid and paraffin increase. The parallelism is closer in the case of the decline of modulus than in that of tensile where the spread is wider.—C. O. North.

Stearic Acid as a Bloom Retarder. It seems to be the prevailing opinion that stearic acid is very apt to bloom out on uncured calendered sheets, and thus cause failure of plied up stock to stick together satisfactorily. While this may be true when high percentages of stearic acid are used, we have, at times, had experiences with blooming which do not seem to follow the general rule. For example, a stock to be used for a specification belt cover, had approximately the following composition: rubber, 42; mineral rubber, 6; zinc oxide, 40; dixie clay, 10; sulphur, 2; accelerator D.P.G.

When this stock calendered it was found that the calendered sheets began to bloom before they cooled off, and by the time the stock was cold the sulphur bloom was so heavy that plying up was out of the question. Varying the calender heats, or the method of running, produced no improvement, nor did such changes as we were able to make in the formula. These included omitting the M. R. and also the clay. Finally it was found that the addition of 0.5 per cent of stearic acid freed the stock from bloom of any kind, no matter how long the calendered stock was held in storage.—K. J. Soule.

The Discussion

C. A. Boggs, Simplex Wire & Cable Co., referred to the limitations surrounding the use of stearic acid in wire insulation; the need for a new and correct dispersing agent to permit better reinforcing value to be obtained from clay; and the need of a relatively quick laboratory method of testing that will parallel the action of a filler in rubber. New laboratory testing methods should produce materials that will do the same thing for other fillers that stearic acid does for carbon black. More theoretical work on adsorption and dispersion should develop new reinforcing fillers and be of great benefit to the rubber industry as a whole and the wire trade in particular.

N. A. Shepard, Firestone Tire & Rubber Co., referring to aging effect mentioned that as the percentage of oleic acid increases, the aging quality of the rubber drops off.

C. O. North, Rubber Service Laboratories, stated that 0.5 per cent of stearic acid improves service wear of tire treads but more than that does not.

W. E. Glancy, Hood Rubber Co., called attention to the facts of record that stearic acid was used in rubber at the Hood company's plant in 1905 and by United States Rubber Co. in 1912.

Rubber Association of America

Accounting Committee Meeting

THE Accounting Committee of the Rubber Association met February 27 at the Yale Club, New York, N. Y., and agreed on a definite program for 1929. Four meetings will be held—one each in March, May, September and November—at which arranged programs under the leadership of a designated member of the Committee will be followed. A definite subject for discussion will be assigned for each meeting.

The first of these meetings was held in Akron, Ohio, March 29, at which W. M. Bechler, Assistant Comptroller of The B. F. Goodrich Co., lead a discussion on the subject of "Forecasting Raw Material Requirements and the Accounting Control of Materials."

Representatives of rubber manufacturers will be welcome at all these meetings.

Manometers[1]

The Simplest Form of Instruments for Measuring Pressure, Vacuum, and Flow of Gases and Liquids

THE U-tube manometer consists of a suitable length of glass tube bent in the form of a U; the ends being connected to the two points between which is the difference of pressure, etc., required to be measured. The total difference between the levels of the liquid in the two arms of the U-tube shows the difference in pressure conditions between the two points to be tested, and a suitable scale set beneath the tube permits direct readings being taken.

One of the chief advantages of the U-tube manometer is that its operation is absolutely reliable because it depends directly upon unchanging physical laws, and not upon diaphragms, springs, or other mechanical equipment which must inevitably deteriorate as time progresses. Since, moreover, its action is differential it is practically independent of inaccuracies in the bore of the glass tubing. For this reason, the manometer may be used to check the accuracy of other instruments. It is therefore of the utmost importance that great care should be maintained throughout the process of manufacture. Strength and reliability are equally important, for it is seldom possible to know where a manometer is to be used. It may, of course, be fixed permanently to a wall, but it is quite as likely to be bumping along in one of the automobiles which travel from place to place testing pipeline pressures in the oil fields.

Accuracy and Construction

The accuracy of the instrument depends upon the U-bend being free from constriction. It must also be perfectly pressure tight, for even the slightest leak would not only create enormous errors in the readings but would also (if under high pressure) be decidedly dangerous. The tubes themselves are made from a special kind of lead glass adapted for bending at comparatively low temperatures. To assure an ample supply of perfect tubes, and to guard against interruption of supply, a stock of over 15,000 feet of glass tubing is always kept available.

The bending of the tubes is a highly skilled job and demands special equipment. It is no easy matter, for instance, to bend 100 inches of tubing required for a 50-inch U-tube in such a manner that the bend is free from constriction and the two ends are exactly the right distance apart to fit into the two metal orifices provided for them in the protecting case. This they must do, otherwise the tube will break when fastened down in place. Even the gas used is specially adapted for the work, and its heating power in B.t.u. and the "spread" of the flame are carefully regulated within narrow limits.

After bending, the tube is laid in the case resting upon a series of corkmounted holder clips, and its ends pushed into the orifices provided in the case, and made pressure tight. The clips are then closed over the tube and the instrument is ready for testing. The method of making the tube leak proof varies according to the pressure involved. For low pressures, up to 30 pounds per square inch, the ends of the tubes rest upon tapered nipples and packing, and both nipples and tube ends are embedded in a packed mass of litharge cement.

For high pressures, from 300 to 1,000 pounds, this is not sufficient, on account of the tendency for the internal pressure to force the ends of the tubes off their seatings. To counteract this, therefore, the U end of the tube is also embedded in litharge cement, secured from movement by screws projecting into it through the metal case. In addition to this, the ends of the extra-thick-walled tubes are provided with steel headers having high-pressure packing glands. This makes a thoroughly leak-proof joint.

Tests

Each manometer is given both a hydraulic and an air pressure test far in excess of that at which it will operate. In some cases a hydraulic test of over a ton and a half is first applied, because, since water is practically incompressible, the slightest leak will reduce the test pressure dial reading to almost zero. Moreover, should the tube break, owing to misalinement or other causes, no dangerous explosion can take place. The scale is finally fixed in position and the instrument calibrated under working conditions.

It is generally preferable to have the manometer scale so made that it gives directly the value of the quantity to be measured, thus avoiding the necessity of multiplying by a "constant" in order to get the information desired. This of course involves keeping a large variety of scales available. Among these are inches of water pressure, inches of oil pressure, plain millimeter or inch scales, pounds and ounces pressure of mercury, etc.

Special Manometers

Two examples of manometers in which special scales and unusual construction are used are the following: One is for measuring pressures and flow of hydrochloric acid vapor. This is so volatile that if the ends of the U-tube were connected to separate pipes in the usual manner the readings would not be accurate. For this reason they are connected to the supply line by a tapped hole cast integral with the manometer head itself.

Another unusual type is that designed for testing the diaphragms which control stopping and starting of the operating motor of refrigerators. For this purpose extreme accuracy is demanded because it is undesirable to make it necessary for the tester to read both levels at once. This requires direct instead of differential readings.

Only about one tube in 25 of regular manometer tubes is able to meet the exacting test for accuracy of internal diameter for such an instrument.

[1] Data supplied by D. C. Beckett, Miriam Co., Cleveland, O.

Rubber Products

The value of rubber products of manufacturing establishments in the United States in 1927 aggregated $1,225,077,114, as compared with $1,257,997,707 in 1925, a decrease of $32,920,593, according to data collected by the Department of Commerce.

	1925	1927
No. of plants	509	516
Wage earners (average)	148,382	141,997
Wages	$191,089,638	$198,073,743
Cost of materials, fuel, power	720,058,847	660,370,209
Value of products	1,257,997,707	1,225,077,114
Value added by manufacture	537,938,860	564,706,905

These figures show the number of plants have increased from 509 for 1925 to 516 for 1927. But the average number of wage earners has decreased 6,385, with a total of 141,997 for 1927, as compared with 148,382 for 1925. Another decrease, $59,688,638, is seen in the cost of materials, fuel, and power, the total for 1927 being $660,370,209, as compared with $720,058,847 for 1925. An increase, however, of $26,768,045 is shown in the value added by manufacture, $564,706,905 for 1927, as compared with $537,938,860 for 1925.

EDITORIALS

Rubber and Tire Outlook

WHILE business analysts find little thus far in 1929 on which to base a positive prediction for the latter part of the year, they are sure that the trend of trade and industry is distinctly favorable. Much satisfaction is derived from the fact that there has been no general let-down from the high 1928 levels, and that automobile production is still well sustained and is steadily becoming more stabilized. So long as the support of that industry in the form of expanding credit be not impaired by any unforeseen condition, and no clouds can yet be descried on the horizon, it may be expected that the closely-related tire industry will continue to enjoy a generous measure of success.

Mission of Business Press

THE fact that the new Chief Executive of the United States was chosen more on account of his business than mere partisan qualifications is regarded by many industrial leaders as also indicating a broader popular appreciation of the part played by business in enhancing public welfare, and a keener realization by Americans of the need of closer accord between government and the industrial forces which have done so much to make the nation great. One powerful factor in promoting this change for the better, and which has not received its just due, is the business press. Leaders credit it with having been particularly helpful in furthering commercial harmony and in bringing about more rational relations between business and government. Nor has any force been more potent in dignifying the accomplishments of the quiet, non-spectacular constructive heroes who have ever added to the wealth of the world and the comfort of humanity while more glamorous characters so often wrought ruin and wretchedness.

One of the foremost organizers of trade organizations, William Butterworth, president of the Chamber of Commerce of the United States, in a recent address on "The Public Responsibilities of Business," paid a graceful tribute to trade journalism when he declared that the wholesome influence which it has exerted in promoting integrity, fair dealing, and efficient service, as well as in inspiring enlightened initiative and its sympathetic consideration by government has never been adequately esteemed. He sees a very important mission for the business press in not only chronicling trade progress, providing a clearing house for the interchange of ideas on better processes and practices, in interpreting the varying trends of trade, and in giving frank and friendly counsel, but also in championing the cause of business when unjustly assailed by misguided uncommercial interests.

Mr. Butterworth views advertising in the business press as indispensable in its sphere as is general advertising in facilitating the mass selling which must take care of mass production. Advertising, he says, has proved to be one of the most potent aids to social and economic progress, through its avowed candor it tends to dispel doubt and distrust, it has made quite obsolete the policy of "Let the buyer beware," and will as certainly cause a worthwhile business to expand as sun and rain on good soil will insure bountiful harvests.

Ideal Tire as Star of Hope

PROUD as the rubber industry may well be of the modern pneumatic tire, so high in quality, admirable in design, and remarkably efficient, the claim of some that it has positively reached the *ne plus ultra* stage can hardly be conceded as yet. Much as we may dislike to admit it, there must be something more beyond. Almost a paragon, there is nevertheless something yet to be desired. True, users' anxiety is now much less than ever as chances of failure are being steadily minimized; but, alas, the inflatable tire can still go flat. Still vulnerable is its essential air cushion, still too close to surfaces that punish tires pitilessly; and though makers have been tireless in their efforts to eliminate this shortcoming, the standard type persists for the simple reason that it is the most practical tire that can now be produced.

Will the present type long continue? Perhaps not. The very exigencies of increasing transportation and the skill and genius of our engineers prompt the belief and encourage the hope that the day is not so far distant when the weak link in an otherwise strong chain will be radically remedied. How or when the revolutionary change will be effected is not easy to conjecture; but perplexing as the problem may be, its solution appears inevitable. Certainly rich will be the reward of him who originates a tire that will defy any road and that may drop only in price.

Bicycle Industry Flourishing

THOSE who had an idea that the automobile had quite routed the lowly bicycle may be surprised to learn that over 4,000,000 of the foot-propelled vehicles, on which the inventor of the pneumatic tire first "tried his 'prentice hand," were made in the United States last year; and that the industry is flourishing.

What the Rubber Chemists Are Doing

Test for Vulcanized Rubber[1]

D. D. WRIGHT

HOOD RUBBER CO., WATERTOWN, MASS.

VULCANIZED rubber is frequently required to withstand, not only the simple stresses such as those of compression, tensile, and shear, but also the combined effects such as torsion, tearing, bending, etc. It has been observed that, as some vulcanized rubber samples age, their resistance to shearing and tearing stresses decreases much faster than their resistance to tensile stresses, as determined under the standard procedure of rubber-testing.

During a study of natural and artificial aging some inner-tube samples, which tested very poorly after the oxygen bomb (50 hours at 60° C. and 20.4 atm.), were filed for further observation. As these tubes aged the tensile tests showed less deterioration than was expected. However, a close examination of these tubes showed that they had developed a very poor resistance to tear and were weak when sudden tensile stress was applied. For sake of brevity this lack of resistance to sudden stress will be called "shortness."

After several attempts to measure this "shortness" property without resorting to some new testing machine, the tongue shear test was developed. It is so named because of the shape of the test specimen and the effect that is produced. It seems to give about the proper rating to these "short" tubes.

The Test

A specimen like that in Figure 1 is prepared by means of a cutting die, as shown by the pattern in Figure 2. Two parallel marks exactly 1 inch apart are placed on the test piece so that they will be near the middle of the parallel section of its tongue. The sample is then placed in the jaws of the testing machine. The lower jaw moves at the rate of 10 inches per minute.

In the usual manner readings of load and elongation are taken up to and including those at rupture. From these measurements and the cross section of the tongue the shear-stress-strain

Fig. 1—Test Specimen

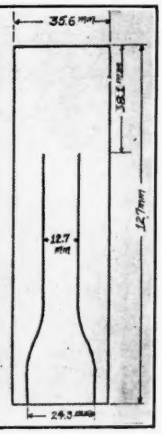


Fig. 2—Pattern of Cutting Die

curve may be plotted and the relative energy to start rupture estimated by determining the area under the curve.

Figure 3 shows the comparison of the shear-stress-strain curves with the usual tensile-stress-strain curves. The reasons that the shear-stress-strain curves do not exactly coincide with the tensile-stress-strain curves seem to be: (1) Different widths of samples were stretched; (2) different rates of stretching were employed; (3) near break certain stocks seem to yield some on

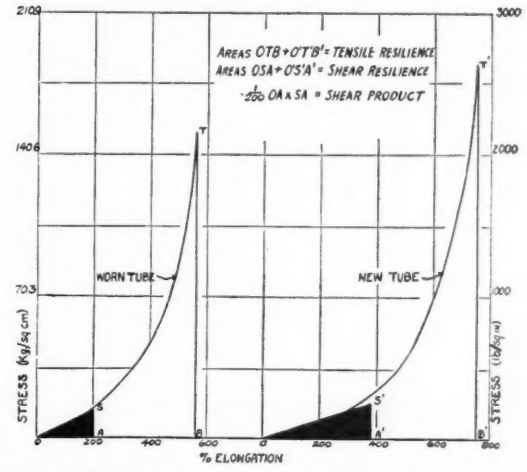


Fig. 3—Stress-Strain Curves of Tongue Shear and Standard Tensile Tests

shearing. In other words, the rupture is very slow while in other cases it is instantaneous.

A shorter and slightly less accurate method of getting the relative energy to rupture the tongue is to take one-half the product, $S \times E/100$, where S is the stress at rupture (kg. per sq. cm.) and E is the per cent ultimate elongation. The product, the "shear product," is close enough for ordinary comparisons and closer to the real energy values than the tensile product is for the relation that it expresses, because lower concavity factors exist in the shear-stress-strain curves.

Mechanism of Test

The manner of rupture and factors influencing the values obtained were studied to learn, first, what was taking place as the rubber was strained in this sort of specimen, and second, if the test piece was properly proportioned. The rupture always takes place at the end of the tongue (*C-D*, Figure 1).

A much smaller expenditure of energy is required to start rupture than would be the case if the same section were broken with the standard dumbbell test specimen.

Since rubber is so elastic, the mathematical analysis of the forces that follow the straining of the tongued specimen is difficult. Therefore, the specimen shown in Figure 1 was ruled off into squares before it was put under strain in order to present a picture of the lines of strain. As the tongue stretches out, the legs *A* and *B* twist upwards and the dips in the lines at *C* and *D* become sharper. It is evident that at these points the rubber suffers the greatest change in direction of strain and also that a marked shearing action is set up. If the cuts at *C* and *D* are rounded with a punch, ruptures are not obtained at such low energy values and the test behaves more like a tensile test.

Application of Test

The tongue shear test is applicable to practically every type of soft-rubber stock produced. It suggests many interesting studies, but its most striking applications are: (*a*) the demonstration of the shortness property of aged inner tubes, (*b*) its

[1] Presented before the Division of Rubber Chemistry at the 76th meeting of the American Chemical Society, Swampscott, Mass., September 10 to 14, 1928.

use as a more sensitive index of the extent of artificial aging, and (*c*) its use with other criteria of cure or by itself to detect the beginning of overcure. Except for showing the comparison of different stocks on this test, only these three applications will be discussed.

Various kinds of stocks are compared in Figure 4 and Table 1. The carbon-black tread stock is taken as par, 100, and all

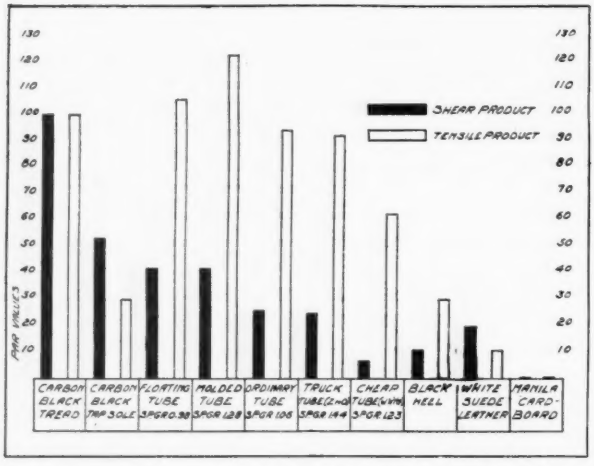


Fig. 4—Comparison of Shear Product with Tensile Product on Various Stocks. Carbon-Black Tread = Par

other values are figured on this basis. Particular attention is called to the tread and tap sole stocks, which show very high shear resistance compared with the truck tube stock. This agrees in general with the tearing resistance of such stocks. The effect of pigments on tear resistance is fairly well defined by the shear-product value, judging by hand-tear determinations. It has also been noted that certain accelerators give better results than others.

TABLE I—VARIOUS STOCKS COMPARED BY T. AGUE SHEAR TEST

Sample	Par Basis Comparison: Shear Product	Tensile Product
Carbon-black tread stock	100	100
Carbon-black tap sole	53	30
Floating red tube, sp. gr. 0.98	42	105
Molded tube, sp. gr. 1.28	42	123
Ordinary red tube, sp. gr. 1.06	26	94
Truck tube (ZnO), sp. gr. 1.44	25	92
Cheap tube (whiting), sp. gr. 1.23	7	62
Black heel	11	26
White suede leather	20	11
Manila cardboard	0	0

The sensitivity of this test to the "shortness" in some aged inner tubes is shown in Figure 3. Here a worn tube is compared with a new tube compounded in nearly the same way. The worn tube had become absolutely unserviceable, yet the tensile criterion rated it 85 per cent as good as the new tube and the resilient-energy criterion, 67 per cent, while shear energy and shear product criteria rated it only 34 per cent as good. This worn tube was very "short" while the new tube showed no "shortness." The worn tube also showed a very weak and grainy tear. The importance of developing high-speed tensile tests or their equivalents to show up this property of "shortness" in vulcanized rubber is evident.

Diffusion of Water Through Rubber

EARL E. SCHUMACHER AND LAWRENCE FERGUSON[1]

THE authors of this paper give the mathematical derivation of a simple formula for calculating the rate of diffusion.

The diffusion measurements have shown: (a) that the rate of diffusion of water through a rubber membrane is inversely proportional to the square of the thickness; (b) that the rate of diffusion decreases greatly with increase in hardness; (c) that the effect of saturating the rubber with water is to increase the rate of diffusion through it, due probably not only to an increase in the water vapor pressure within the rubber, but also to a decrease in hardness; (d) that there is no intimate relationship between rate of diffusion and minor variations in the composition of the rubber.

As composition affects the hardness of a rubber, it obviously plays a role in the diffusion problem. Thus, in general, pale crepe rubber is tougher than smoked sheet and vulcanized pale crepe was found to be less permeable than vulcanized smoked sheet. Rewashing the smoked sheet softens it, causing greater permeability. Other variations in the composition of the rubbers, such as vulcanization, fillers, and low protein content, do not seem to greatly affect the permeability.

The relation between hardness and permeability to water is very useful in explaining other phenomena. A moderate increase in the temperature of a rubber sheet lessens its hardness while at the same time it becomes much more permeable. The increase in permeability is so great that it seems reasonable to believe that part of it may be due to the decrease in hardness. The loosening in structure, possibly resulting from the saturation of rubber with water, might, by its softening effect, be the chief cause of the accompanying increase in permeability.

[1]Bell Telephone Laboratories, 463 West St., New York, N. Y.

Rubber Structure Research[1]

E. A. HAUSER[2]

IN this paper, the full title of which is, "Rubber Structure Research and Its Bearing on the Elastic Properties of Colloids in General," the author discusses the three lines of research: (1) the isolation of two constituents of rubber; (2) the transformation of one constituent into the other; and (3) x-ray interpretation of rubber structure. This interpretation was illustrated by a model which exhibited the peculiar tendency of racked rubber to wind back in a helix when released or heated.

The author summarizes, as follows, his views on the credit due to the colloid chemists and physicists for the advance in knowledge of the structure of rubber:

The least to which in my opinion the colloid chemist or colloid physicist may lay claim is credit, not only for a fair contribution to the structure of rubber, but for more than that—for having laid the foundation of an entirely new conception of fibrous and elastic matter in general; this with the aid of a method, x-ray analysis, which has been so severely criticized in its connection with colloidal research. I have purposely said "foundation," because considerably more work will have to be done, and a final conception will not be generally accepted until we have learned to correlate this finding with results still to be obtained in a study of double-refraction phenomena and possibly when we have learned more in regard to the interpretation of results obtained when using light of intermediate wave lengths. There is, however, nothing which should discourage us and our slogan for the purpose of increasing progress should be at all times—keep going—and how?

Note—To avoid any future dispute in regard to the two-phase theory of rubber, the author wishes to state that the two phases of the rubber hydrocarbon as revealed by chemical experiments and x-ray analysis are in themselves sufficient to produce elastic properties, the structure of the Hevea latex particle as ascertained with the micromanipulator should not be confused therewith. As this latex-particle structure in itself is a physically elastic system [see Fessenden, *J. Franklin Inst.*, 142, 187 (1896)] we may assume that the superiority of unmilled Hevea rubber is caused by an addition of these two factors.

The author wants it, furthermore, to be understood that he does not claim a definite membrane for the Hevea particle, but a nevertheless detectable zone of a hydrocarbon of distinctly elastic properties, whereas the inside (as long as it has not come in contact with the serum or with air) is highly viscous and plastic. This zone is presumably formed by a polymerization at the interface hydrocarbon—protein containing water dispersing medium.

[1]Presented before the joint session of the Divisions of Rubber and Colloid Chemistry at the 76th Meeting of the American Chemical Society, Swampscott, Mass., September 10 to 14, 1928.

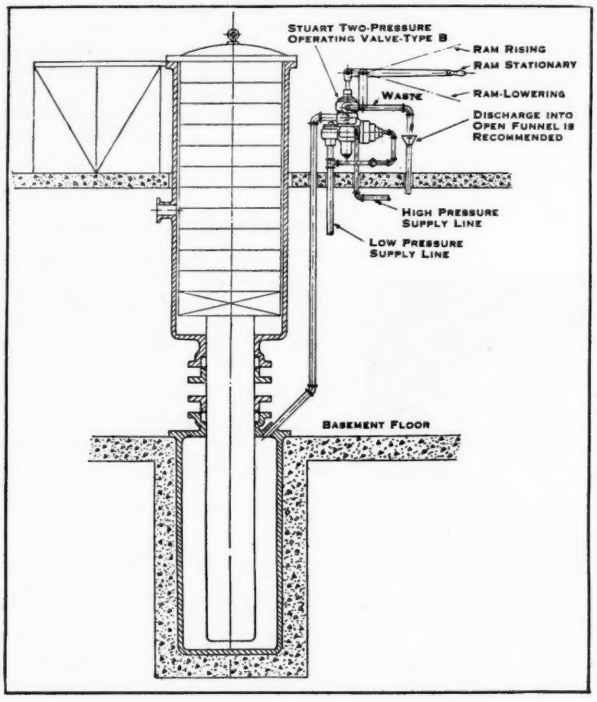
[2]Non-resident associate professor of colloid chemistry, Massachusetts Institute of Technology.

Utilizing Brewery By-Product

More extensive employment in German rubber works of such an inert gas as carbon dioxide for inflating tire makers' and repairers' air bags and for preventing solvent evaporation from gum-dipping tanks, as well as lessening fire hazard, is expected to follow the working out of a cheaper method of recovering this gas hitherto largely wasted in fermenting materials in breweries and distilleries.

New Machines and Appliances

Hydraulic Operating Valve for Vulcanizing Presses



Stuart Hydraulic Valve Operating a Tire Heater

PLANT engineers appreciate that hydraulic power cost is a very expensive item in production overhead cost and consequently they would be interested in an operating valve designed to effect a reduction of this item.

The hydraulic piping system of a tire press heater is here shown embodying a special hydraulic operating valve designed for any press supplied with both high and low hydraulic pressures. The diagram indicates the valve located on the operating floor. However, it may be placed on the floor below and operated by lever or remote control.

It should be observed that this particular valve is designed for use with any press supplied with both high and low hydraulic pressures. It combines in itself a low pressure valve, a high pressure valve, an exhaust valve, a check valve, and in addition, an automatic control device. It is automatic and thus removes the human element that is responsible for mistakes and failures.

It follows therefore that the operator can no longer run the ram up with pressure water. Neither can he run the expensive high pressure water into the sewer through failure to close the exhaust valve. This also prevents any possibility of lowering the high pressure on other presses which are on cure.

The automatic action also prevents the ram from being shot up with high pressure water and damaging the press. Because of its unfailing check valve, the low pressure line is in no danger of destruction by high pressure water backing into it. The design of the valve provides that the wear will be on the hydraulic packers which are arranged easy of access to eliminate costly repairs and shut downs.

This valve is of special interest in rubber works and is used almost exclusively in most of the larger plants. In service the pressman starts operation of the valve merely by pulling the lever and is then free to turn to his duty at the next press. He can no longer make a cure at low pressure nor forget to turn on high pressure water. The latter comes on automatically at the right time and insures proper cure as to pressure. This automatic action described practically insures against damaging goods through lack of pressure.—Pittsburgh Valve Foundry & Construction Co., Pittsburgh, Pa.

Fabric Drier Drive

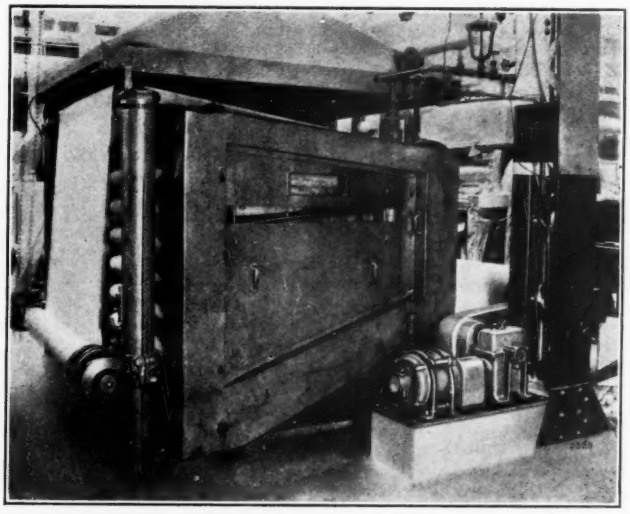
THE very compact and effective worm reduction gear here pictured has been applied for the operation of fabric driers in rubber goods manufacturing plants. For this purpose a 3 h. p. motor is used operating at 1,160 r. p. m. This speed is lowered by the reduction unit to 59½ r. p. m.

The power is transmitted to the driving shaft of the drier through a flexible coupling. A supplementary chain drive is taken off the slow speed shaft for operation of winding up the roll of dried fabric.

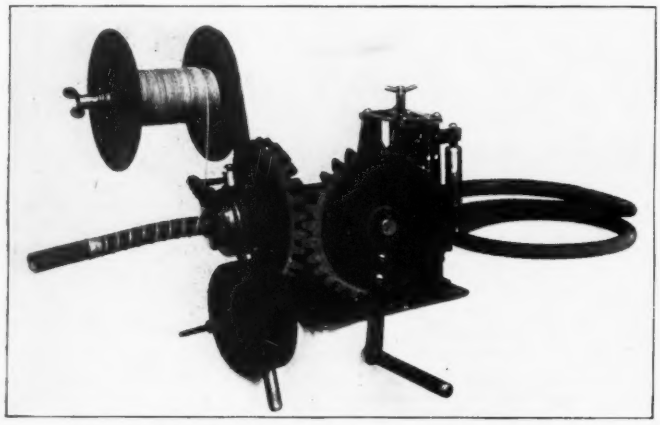
The worm gear reduction unit comprises a chilled nickel bronze cast worm gear and worm cut from an alloy steel forging. The worm is mounted on ball bearings, and the gear shaft on large bronze general bearings. The latter are of ample proportions for the needs of any overhung load such, for example, as the chain drive above mentioned.

Except for the ball bearings there are only two working parts in the speed reducer, namely the worm and the worm gear. This feature is largely accountable for the great reliability in service of this type of drive.

Lubrication is provided by an oil supply contained in the lower part of the housing. The worm dips into this oil and transfers it to the worm gear faces. Some of it is carried on upward and this excess is gathered by oil scrapers located at either side of the top of the gear and by them directed to the gear shaft bearings and thrust plates.



De Laval Worm Reduction Gear Applied to a Fabric Drier



Apparatus for Wiring Small Hose

This reduction unit requires no attention other than to try the oil cocks, at intervals, on the side of the unit to insure that the oil supply is being maintained at a proper working level.

A notable feature of this type of gearing is that it affords a convenient right-angled drive and permits the motor to be mounted parallel and close to the driven machine instead of projecting into the aisle space.—DeLaval Steam Turbine Co., Trenton, N. J.

Hand Wire Winder

A CONVENIENT little bench machine of German design and manufacture is here depicted. Its purpose is for wire winding small hose of 16 to 45 mm. (⅝ to 1¾ inch) external diameter.

The machine is operated by a simple hand crank drive. The hose is fed through the machine by means of two rollers actuated from the crank lever by chain connection. There are exchangeable dies or mouthpieces of varying diameters to accommodate the hose.

This device is especially advantageous for hose dealers who are thus enabled to wire in a few minutes, upon order, any length of hose required.

The machine itself occupies about 18 by 18 inches. The wire is fed from a stock reel supported above the work on a short arm attached to the frame of the machine. Braking effect on the wire reel is regulated by a wing nut against a spiral spring and disk washer pressed against the side of the reel.

The hose does not require to be unwound but may be fed direct from a stock reel conveniently placed with relation to the machine.—Albert Ziegler, Giengen a. Brenz, Germany.

Laboratory Internal Mixer

A MIXER of a type utilized widely in many important industries, including rubber, has recently been under test at the Bureau of Standards as an internal mixer for rubber.

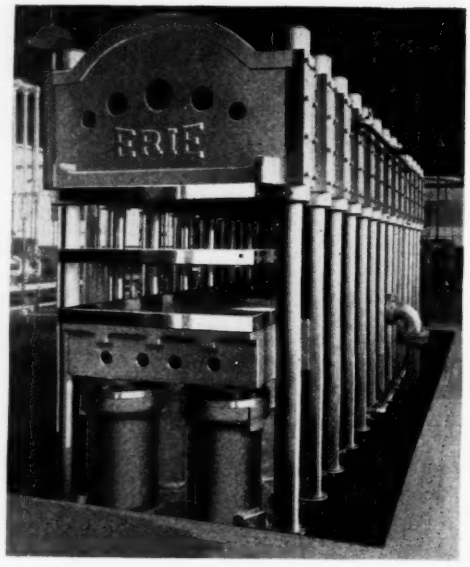
The machine consists essentially of a rectangular tiltable trough curved at the bottom to form two half-cylinders. In this trough are two horizontal blades actuated by gearing placed on both sides of the trough. The blades are so designed and located that they sweep the entire area of the half-cylinders on each revolution and, revolving toward each other at unequal speed ratio, pass the material back and forth from one to the other, imparting to it both transverse and lateral motion.

The clearance between blades and trough is made as close as possible. Therefore none of the material being mixed can escape the action of the blades and all particles of it are caused to change relative positions with every other particle constantly while the blades are in motion.

The working capacity of the laboratory mixer is 500 to 2,500 grams of rubber. The machine is either belt or motor driven with variable speed control. Temperature control is effected by a jacket for steam and water at the bottom of the cylinder.

This internal mixer has also been found convenient in drying rubber and with it one can work with very soft and tacky rubbers difficult to handle on a roller mixer.

The machine can also be used to make special rubber cements having a wide range of consistencies.—Baker Perkins Co., Saginaw, Mich.



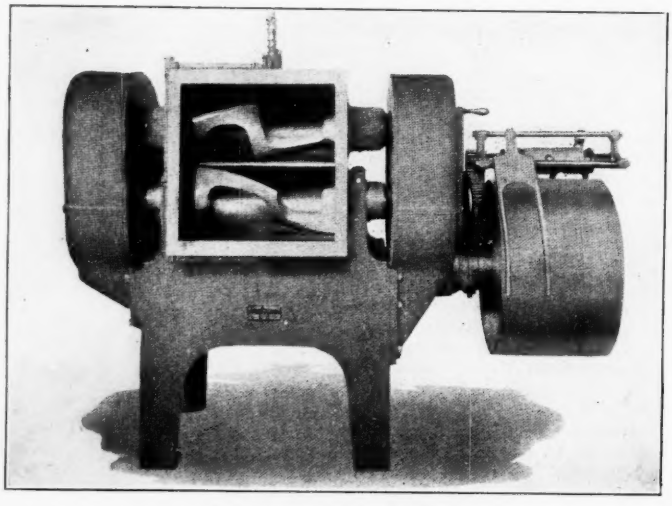
Erie Thirty-Four Foot Tiling Press

Hydraulic Press For Floor Tiling

THE two-deck hydraulic press here illustrated has recently been installed in the Aetna Rubber Co., Cleveland, O., as a part of their equipment for manufacturing floor tiling. This press is provided with two openings and polished rolled steel steam platens drilled from the solid. The dimensions of these are: width 54 inches, length 32 feet, and thickness 3½ inches. The press is operated by a double row of 14 rams giving a well distributed platen pressure of 5,000 tons.

For the past twenty-five years the builders of this press have manufactured high grade machinery and, having designed a comprehensive line of rubber machinery, they are rapidly becoming leaders in this field, offering to the trade a recently designed line of mills, refiners, tubers, strainers and hydraulic presses.—Erie Foundry Co., Erie, Pa.

QUIGLEY "TRIPLE-A" ANTI-CORROSION solutions protect by penetrating material surfaces, sealing them tightly against all corrosive liquids.—Quigley Furnace Specialties Co., 26 Cortlandt St., N. Y.

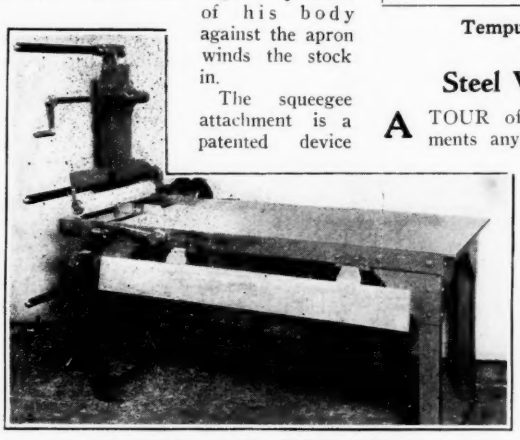


Laboratory Internal Mixer

Cord Tire Fabric Splicing Machine

THE illustration represents an all steel table for splicing cord tire fabric from the bias cutter, rolling it into a liner and applying a strip of gum over the entire width or any part of the width. The table has right and left adjustable guides to keep the stock centered. The liner spindle is made square to take the stock shell and has a brake to retard the liner as may be desired.

In operation the liner passes over a spreader bar and up through a slot in the table top so that the cord fabric can be butt spliced if desired. The squeegee is applied as the liner and the stock wind on a shell driven by a 1 h.p. motor. The spindle speed is controlled through a clutch operated from an apron board in front of the table. This leaves the operator's hands and feet free and the slightest pressure of his body against the apron winds the stock in.



Utility Single-Ply Windup Table

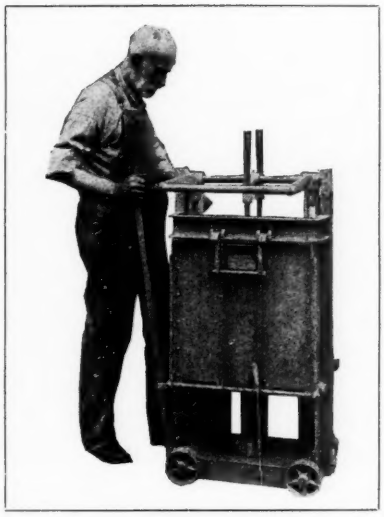
The squeegee attachment is a patented device designed to take the thin gum stock out of the liner, attach it to the stock and wind the empty liner back on a stock shell. This device permits the application of gum to any part of the cord stock as desired and thereby effects great savings in gum as well as labor.—Utility Manufacturing Co., Cudahy, Wis.

Metal Scrap Bundling Press

THE accumulations of scrap aluminum in the form of used labels and trimmings can be conveniently and advantageously handled for salvage by the use of the small hydraulic baling press here pictured.

This press has a combined rapid and powerful toggle movement with a 12-ton hydraulic ram. The toggle movement does the initial packing of the scrap and the hydraulic ram gives the bundles the necessary density. The press turns out bundles 12 inches wide, 20 inches long and from 12 to 18 inches high, depending on the character of the material, which also governs the weight of the bundles.

The press weighs 375 pounds and is well constructed of high tensile steel. It is mounted on truck wheels so that it can be moved to the scrap pile instead of moving the scrap of whatever kind to the machine. —Samuel H. Garrett, 234 N. Thirteenth St., Philadelphia, Pa.



Tempus Scrap Bundler

Steel Work Benches

A TOUR of manufacturing establishments anywhere would disclose that many are ill equipped with work benches. Home-built wooden tables and benches, worn beyond the stage of serviceability, are tolerated regardless of their failure to meet the requirements of convenience and efficiency. Such benches occupy space in many rubber plants, particularly in the older ones, where, of all places, they should not be used because of their readiness to roughen up, hold loose dirt, and give up splinters causing damage to material in process, besides fostering general untidiness and slack methods of work.

In contradistinction to this are the steel frame bench legs and steel work tables, types of which are here illustrated. Such benches are superseding old style wooden ones by virtue of being more rigid, never becoming wobbly, and costing less. They are to be had ready for use in any size or quantity from stock. This is a great convenience as contrasted with the old time carpentering with its lumber, day work, and expense.

In the case of removal, steel bench legs are ideal because they can be picked up bodily and moved about without any trouble whereas wooden ones are so damaged by being pried loose that they might as well be scrapped then and there.

Going a step further, steel bench legs are used to support steel tops for work benches and tables in many forms. One of the simplest of these is pictured in the illustration. By suitably flanging its front and back edges both stiffness and appearance have been maintained.

The construction of these benches is such that many modifications of detail are possible to adapt them for special purposes, for example, mounting assembly of small parts, rubber, cementing work, inspection and sorting, or for mounting small bench machines such as drills, presses, etc.—Standard Pressed Steel Co., Jenkintown, Pa.

Hallowell Work Table with Shelf

Textolite Sockets

SOCKETS, composed of molded textolite bodies to which are assembled a screw shell and center contact with leads attached, and made weatherproof by means of a special bushing, have been developed by the Merchandise Department of the General Electric Co., Bridgeport, Conn. These sockets are designed particularly for use in outdoor string lighting, signs, damp cellars, or any place subjected to dampness, weather, steam vapor or acid fumes. They are rated 660 watts, 600 volts.

Hallowell Double Type Bench Legs

Foreign Trade Information

For further information concerning the inquiries listed below address United States Department of Commerce, Bureau of Foreign and Domestic Commerce, Room 734, Custom House, New York, N. Y.

Number	Commodity	City and Country	Purchase or Agency
36,477	Tires	Tallin, Estonia	Agency
36,496	Sundries and specialties	Buenos Aires, Argentina	Both
36,551	Rubber goods	Bombay, India	Both
36,555	Heels	Oslo, Norway	Agency
36,584	Balls	Prague, Czechoslovakia	Both
36,585	Solid tires	San Juan, P. R.	Both
36,586	Heels	Nuremberg, Germany	Either
36,587	Asbestos packing	Manila, P. I.	Agency
36,591	Tubing	Cairo, Egypt	Purchase
36,621	Druggists' sundries and sanitary goods	Tientsin, China	Both
36,634	Redeemed scrap rubber	Hamburg, Germany	Agency
36,652	Tires	Cairo, Egypt	Agency
36,666	Boots	Willemstad, W. I.	Agency
36,748	Fire hose	Panama City, Panama	Agency
36,763	Canvas shoes	Cairo, Egypt	Agency
36,794	Crepe rubber for soles	Prague, Czechoslovakia	Either
36,801	Tires and tubes	Tangier, Morocco	Either
36,804	Balls	Plauen, Germany	Purchase
36,872	Women's overshoes	Berlin, Germany	Agency
36,873	Shoes and other articles	Milan, Italy	Agency
36,874	Boots, overshoes, bathing goods and canvas shoes	Fiume, Italy	Agency
36,875	Tennis shoes	Geneva, Switzerland	Agency
36,876	Tires	Sofia, Bulgaria	Agency
36,877	Tires	Sofia, Bulgaria	Agency
36,879	Boots and shoes	Berlin, Germany	Agency
36,960	Balloons	Zurich, Switzerland	Purchase
36,971	Balloons	Winnipeg, Canada	Purchase
36,999	Bathing caps	Prague, Czechoslovakia	Agency
37,024	High pressure and balloon tires	Jaffa, Palestine	Agency
37,056	Overshoes	Amsterdam, Netherlands	Purchase
37,057	Tires	Bucharest, Rumania	Agency
37,066	Raincoats	Bogota, Colombia	Agency
37,067	Boots, overshoes and canvas shoes	Basel, Switzerland	Agency
37,099	Tires and inner tubes	Stockholm, Sweden	Purchase

Foreign Trade Circulars

Special circulars containing foreign rubber trade information are now being published by the Rubber Division, Bureau of Foreign and Domestic Commerce, Washington, D. C.

Number	Special Circulars
2224	Canadian Tire Exports, December, 1928.
2225	Canadian Tire Exports, Calendar Year 1928.
2227	Canadian Exports of Footwear, Calendar Year 1928.
2228	Canadian Exports of Mechanical Goods, Calendar Year 1928.
2231	Comparative Statement Showing Number of Automobile Casings Shipped from the United States to Foreign Countries, 1926, 1927 and 1928.
2234	British Exports of Automobile Casings, December and Calendar Year 1928.
2235	British Exports of Footwear, December and Calendar Year 1928.
2236	Comparative Exports of Boots and Shoes from United States, Canada, and United Kingdom, Calendar Year 1928.
2237	Comparative Statement Showing Pairs of Boots Shipped from United States to Foreign Countries, 1926, 1927, and 1928.
2238	Comparative Statement Showing Number of Pairs of Shoes Shipped from United States to Foreign Countries, 1926, 1927, and 1928.
2239	Comparative Statement Showing Number of Pairs of Canvas Footwear Shipped from United States to Foreign Countries, 1926, 1927, and 1928.
2240	French Tire Exports, Calendar Year 1928.
2241	French Footwear Exports, Calendar Year 1928.
2244	Comparative Tire Exports from the United States, Canada, United Kingdom, and France, Calendar Year 1928.
2246	Comparative Statement Showing Amount of Tire Repair Material Shipped from the United States to Foreign Countries, 1926, 1927, and 1928.
2253	Crude Rubber News Letter.
2258	Comparative Statements Showing Number of Pounds of Rubber Belting Shipped from the United States to Foreign Countries, 1926, 1927, and 1928.
2259	Comparative Statement Showing Number of Pounds of Hose Shipped from the United States to Foreign Countries, 1926, 1927, and 1928.
2260	Comparative Statement Showing Number of Pounds of Packing Shipped from the United States to Foreign Countries, 1926, 1927, and 1928.

Rubber Trade Inquiries

The inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The Editor is therefore glad to have those interested communicate with him.

Number	Inquiry
1214	Manufacturer or source of "Grahamit."
1215	Information regarding "Thiocole."
1216	Is there any use for small rubber blocks cut from cured slab rubber?

Legal

Patent Suits

Piston-rod Packing, No. 1,000,293, Robinson patent, for piston-rod packing, C. C. A. N. Y., claim 1 Held valid and infringed. Beldam v. Garlock Packing Co., 29 F. (2d) 673. *Official Gazette*, Vol. 379, p. 695.

Rubber Nipples, No. 1,420,287, R. Sanderson, method of and apparatus for making rubber nipples, D. C., N. D. Ohio, E. Div., Doc. 2502, The Pyramid Rubber Specialty Co. v. The Lion Rubber Co. Patent held valid and infringed Jan. 18, 1929. *Official Gazette*, Vol. 379, p. 700.

Treasury Decisions

Balls, No. 7897. Protests 262,881-G, etc., of Geo. S. Bush & Co., Inc. (Seattle). Rubber balls classified as toys at 70 per cent ad valorem under paragraph 1414, tariff act of 1922, are claimed dutiable at 30 per cent under paragraph 1402.

Opinion by J. Sullivan. The rubber balls in question were held dutiable at 30 per cent under paragraph 1402 as claimed. Bush v. United States (T. D. 42546) followed. *Treasury Decisions*. Vol. 55, No. 7, p. 28.

Belgian Tire Exports—1928

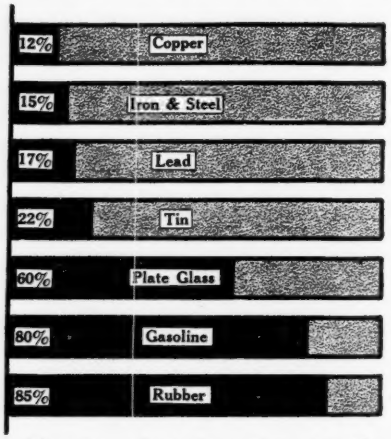
According to preliminary official statistics, Belgium exported 6,259,800 kilos weight of solid and pneumatic tires and tubes during the calendar year 1928 as compared to 4,134,600 kilos weight in the same period of 1927. It is estimated that during the calendar year 1928, 447,128 automobile casings were exported from Belgium, which compares with 295,328 for the same period of 1927. These estimates are based on the rate of one automobile casing being exported for about every fourteen kilos weight of solid and pneumatic tires and tubes.

How Reclaim Exports Rose

Exports of American reclaimed rubber were 134 per cent higher in volume in 1928 than in 1927, and 31 per cent higher in price. Minor manufacturing countries that bought more were Mexico, Spain, Cuba, Palestine, and the Union of South Africa.

Twenty times as many automobiles were exported from the United States last year as in 1913, according to the foreign trade division of the American Motorists' Association. Fifteen years ago 28,486 automobiles were shipped to foreign countries while last year 582,277 cars were exported. The 1928 export figure is the highest on record.

Consumptive Power of Auto Trade



The above chart shows the automotive trade's percentage consumption of the 1928 outputs of seven industries, with the full bar representing 100 per cent.—*Your Money*, Standard Statistics Co., New York, N. Y.

Editor's Book Table

Book Reviews

"La Gomme de Balata." By A. D. Luttringer. Published by A. D. Cillard, 49 rue des Vinaigriers, Paris. Paper 5⅝ by 8¾ inches, 49 pages.

This is a volume of the encyclopedia of caoutchouc and of plastic substances. Balata gum has numerous industrial uses, but up to the present there is no work in existence devoted to this interesting material. The booklet covers the following subjects: General, Origin, Collection, Orinoco Valley, British Guiana, French Guiana, Surinam, Brazil, Peru, Properties, Washing, Applications, Use in Rubber Articles, Regeneration, Analysis, Price, World Production.

"Rules and Regulations to Govern Transactions Between Sellers and Factory Buyers of Crude Rubber in the United States of America." Adopted by The Rubber Association of America, Inc., 250 W. 57th St., New York, N. Y. Effective as of Feb. 1, 1928 and as amended July 2, 1928 and Dec. 12, 1928. Paper, 6 pages, 4 by 9 inches, form for standard contract.

This pamphlet contains, besides the revised rules and regulations, a "Standard Contract" also adopted by the Rubber Association. The association recommends that all rubber manufacturers make their purchases under these rules in accordance with the "Standard Contract" and in conjunction with the "Official Crude Rubber Type Samples" adopted as of Oct. 28, 1927, with description amended as of Jan. 24, 1928. These rules are printed in full on pages 65 and 66 of this issue.

"British Standard Specification for Friction Surface Rubber Transmission Belting." The British Engineering Standards Association, 28 Victoria St., London, S. W. I. Paper; 11 pp., 5½ by 8½ inches. Illustrated.

This pamphlet, No. 351, issued February, 1929, covers the standard practice with regard to the specifications and testing of friction surface belting. The term "friction surface" is defined and the specifications prescribe construction, materials, and dimensions. Methods of testing and service conditions are detailed.

"Proceedings of the Thirty-first Annual Meeting." Part I Committee Reports, New and Revised Tentative Standards. Part II Technical Papers. American Society for Testing Materials, 1315 Spruce St., Philadelphia, Pa., Cloth, 6 by 9 inches.

Part I contains the annual reports of forty-two standing and research committees and three joint committees of the A. S. T. M. They include reports of committees on Ferrous Metals, Effect of Temperature on the Properties of Metals, Non-Ferrous Metals, Cement, Ceramics, Concrete, Drain Tile and Specifications for Concrete Drain Tile, Gypsum, Lime, Preservative Coatings, Petroleum Products, Road Materials, Coal and Coke, Waterproofing Materials, Electrical Insulating Materials, Rubber Products, Textile Materials, Thermometers, Methods of Testing and Nomenclature and Definitions; eighty-one tentative standards which have either been revised or are published for the first time; annual address of the president and the annual report of the Executive Committee.

Part II contains forty-six technical papers with discussion. These contain valuable information on results of investigations by experts in the field of engineering materials including research problems involved in trans-oceanic telephony, the fatigue of metals, the effect of temperature on the properties of metals and investigation on the corrosion-fatigue of metals, and significance of tests for gasoline and motor oils. Mention should also be made of the many other papers on cement and concrete, and on bituminous mixtures, rubber and a number of papers of interest in connection with the testing of materials describing new testing apparatus.

New Publications

"A Review of Witco Advertising" is a bulletin recently issued by Wishnick-Tumpeer, Inc., 251 Front St., New York, N. Y., which will be distributed to the trade, on request. The booklet contains 21 outstanding advertisements featured by this organization last year.

"Review of the Rubber Market for 1928" has been released by Symington & Sinclair, 17 Mincing Lane, London, E. C. 3, England. It contains much important data and many statistics.

"Tire Inflation Pressures—1929 Model Cars" is a poster prepared by The Rubber Association of America, Inc., 250 West 57th St., New York, N. Y., which gives recommended inflation pressures for front and rear tires for the 1929 models of all passenger cars. This poster is distributed without charge to gasoline filling stations and public garages throughout the United States. Copies are supplied to tire manufacturers at cost for distribution to their dealers.

"Schradertown News," a new monthly picture-paper, is published by A. Schrader's Son, Inc., valve and gage makers, Brooklyn, N. Y. It is primarily a newspaper of general interest to automobile accessory dealers, and follows in appearance the leading tabloids. The Schradertown Band, new radio feature which Schrader is sponsoring every Friday night, is featured in the first issue Another big story describes the $1,000 prize contest which Schrader is conducting among its dealers. "Here and There in the Automotive World" is the headline for the two center pages which are devoted to real news pictures. A comic strip completes the page. Remaining pages are given over to editorials, letters, and an illustrated feature.

"Advertisements which reflect the scope of R & H Chemicals and Service" is the title of a booklet issued by The Roessler & Hasslacher Chemical Co., 10 E. 40th St., New York, N. Y. In it are given the objectives of R & H advertising, 16 typical specimens, R & H advertising media, and a list of booklets containing many valuable facts for those interested in the results of chemical research and experimentation.

"Important Factors to Be Considered in Gauging the Rubber Market" is a 12-page booklet released by Paul Elbogen & Co., Inc., crude rubber dealer, 89 Broad St., New York, N. Y. Paper, 3⅞ by 9⅛ inches. It covers briefly the essential items of consumption and production that influence the rubber market.

"Bentonite. Its Properties, Mining, Preparation, and Utilization" is Technical Paper 438 issued by the Department of Commerce, Bureau of Mines. Concerning the proposed uses of bentonite in rubber work the suggestion is made that alkali bentonite or sub-bentonite might be utilized in the preparation of rubber emulsions for sprayed rubber. Bentonite has been used to effect aqueous dispersions of rubber by the Pratt method.

"Bristol Cap and Set Screws" is the title of a 28-page catalog issued by The Bristol Co., Waterbury, Conn. It is fully illustrated showing the great variety of set screws designed for every set-screw need but pictures them applied to serve in examples of the most exacting work.

Dominion Rubber Co., Ltd., Toronto, Canada, has issued a broadside illustrating and explaining the characteristics and advantages of "Uskide, The Wonder Sole."

The Carlyle Johnson Machine Co., Manchester, Conn., has issued a loose-leaf clutch catalog which gives the various sizes and types of Johnson friction clutches, prices and dimensions, etc., and reprints of the company's advertisements in various industries. The general catalog shows these clutches and their applications in about a dozen large industrial fields. Another catalog is assembled for each industry showing pages of various applications of the company's clutches to different machines and problems in that particular industry.

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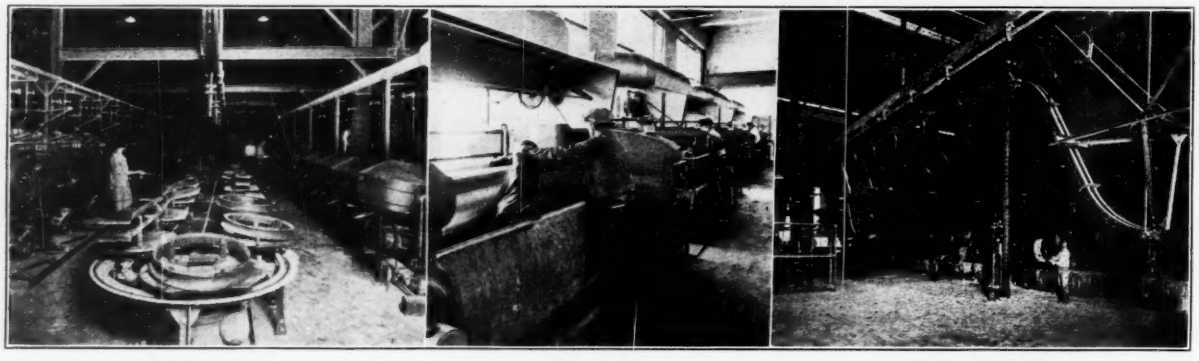
German Tire Exports—1928

During the calendar year 1928 Germany exported 180,193 automobile casings as compared to 154,055 in the calendar year 1927. Inner tubes exported from Germany during the calendar year 1928 amounted to 166,465 as compared to 174,532 in the same period of 1927.



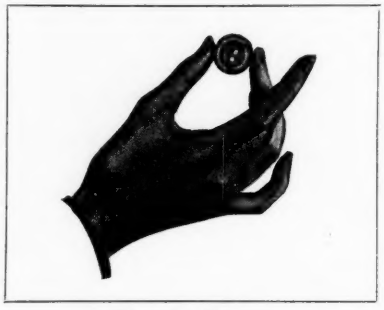
TUBE CURING MILL ROOM TIRE CONVEYOR

Views in the Firestone Tire & Rubber Co.'s Plant in Los Angeles, Calif.

New Goods and Specialties

Indestructible Rubber Button

HERE is a button that the manufacturer guarantees will not break. It is made of rubber—semi-soft inside, semi-hard outside. Under ordinary pressure it will not bend, but under extreme pressure will bend double without breaking. Chemicals used in laundering will not affect this button or fade its colors. Since it is rubber, it does not cut the threads that fasten it to garments. It never scratches because it does not chip off or break.



Ever-On Button

Huntington's Ever-On rubber buttons are designed especially for children's garments, underwear, and all articles of apparel that require frequent washing. They may be had in white, black, olive green, blue, flesh, and khaki. 2-hole buttons are 22 ligne and 4-hole buttons are 27 ligne. Huntington Rubber Mills, Portland, Ore.

Auto Cushion

AN entirely new delight in motoring is afforded by the Airubber Bodifit auto cushion which gives armchair comfort in any automobile.

Airubber Bodifit Cushion

This cushion, placed on the seat or at the driver's back or side, not only absorbs all the jars and jolts of travel but may be used to bring the driver nearer the brakes, pedals and wheel, thus adding to both his strength and his comfort.

It can be used also as a pillow on the front porch, in camp, as a back cushion on a lounge, in a canoe, on a chair—anywhere to provide comfort. It is easily and quickly inflated. It comes in two models: durable rubberized olive drab twill, weight 16 ounces; or serviceable, good-looking corduroy in chestnut, golden brown, auto smoke gray, and dark blue, weight 18 ounces. Both models are the same size, 16½ x 17 inches.—New York Rubber Corp., Beacon, N. Y.

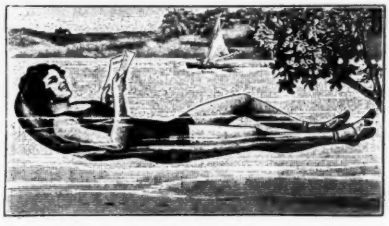
Booster Balloons

DEALERS who handle United States tires are afforded a splendid opportunity to advertise their wares in a novel and striking manner. This is by the U. S. Tire Toy Balloons made by The Perfect Rubber Co., Mansfield, O. These gayly colored balloons bear, besides the "U. S. Tires are Good Tires'" medallion, the name and address of the dealer. There are four models: 70A inflates 10 inches in diameter and is equipped with a twist valve; 70B also inflates 10 inches but boasts a large squawker stem; 10B Airship inflates 16 inches long and 4½ inches in diameter and is equipped with twist valves; and 125 Airship inflates 24 inches long and also has the twist valves.

No. 70B Squawker

Siesta in the Water

AN ideal water sport appliance is the "Siesta in the Water" which permits swimming while lying either on the chest or on the back. It offers the arms full freedom of motion in any comfortable position in the water. It comes in three sizes, small, medium, and large. A bag to match may be had in rubberized checked material or printed rubberized satin.—Flugel & Polter Gumminwaren-Fabrik, Leipzig, Germany.



German Swimming Novelty

New Coat-Pocket Raincoat

BESTYETTE DRI-LITE is the lightest, real raincoat made for it weighs only 19 ounces. It affords, however, absolute protection against any kind of rain, yet is light enough to fold up and slip into a pocket when the sun shines. Because of a new proofing process, which makes possible the use of very light material, this raincoat is said to be stronger and more durable than coats two or three times as heavy. Bestyette is also guaranteed. It is made for men, women, and misses.—N. Y. Mackintosh Clothing Co., Mamaroneck, N. Y.

Fits the Pocket

New Cushion Tire

AN innovation in cushion tires for trucks is the Collette demountable cushion tire. A new principle featured is the V-shaped openings which eliminate vibration. There is the same resiliency around the entire circumference. The holes are corrugated and designed to radiate heat and keep the tire cool.

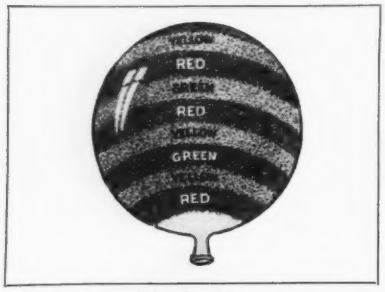
Collette Tire

These tires are on standard rims of the popular flange type and are, therefore, easy to apply. Perfect adhesion to the rim is another satisfactory feature of this tire designed to make truck operation efficient.—Collette Cushion Tire Co., Manitowoc, Wis.

Floating "Rainbos"

A GORGEOUSLY colorful item called the "Rainbo" balloon has just been introduced by The Oak Rubber Co., Ravenna, O. The balloon offers a true rainbow effect, being decorated with stripes or bars of contrasting colors which blend artistically into one another.

Compound opaque and transparent balloons are available. Both are decorated with various color combinations. The com-



The Rainbo

pound balloons carry their colors on the outside and therefore make an attractive display when deflated in the box as well as when inflated, thus satisfying the requirements of the stores.

The transparent balloons are brilliantly colorful when inflated, but do not show their color effect when deflated. The transparent item is therefore limited largely to the street vendors or others who sell balloons inflated.

Tread Grip Heel

THE heel here pictured with an insert of non-slipping resilient rubber has certain unique features of construction that give it interest. It consists of a molded shell of hard rubber serving not only as a container for securely holding a sponge rubber tread piece but as a nailing support for attachment of the

Non-Slip Heel

combination heel to the leather heel seat of the shoe. Molded within and encircling the hard rubber part is a pair of twisted wires with open spaces at intervals, spaced to coincide with nail holes molded in the tread. The porous rubber pad forms a resilient tread and yields with a cushioning action to permit the weight of the person being supported on the surrounding hard tread section.—Frederick A. Schultz, Hasbrouck Heights, N. J.

Combination Bathing Accessories of Rubber

VERY new and convenient is a combination bathing cap, bag, and belt manufactured by The Omo Mfg. Co., Inc., Middletown, Conn.

Heavy, narrow rubber strips on the cap brim hold the belt, which serves as the handle of the bag. With the belt in use, the brim is turned back and the bottom of the bag forms the crown of the cap. Either the plain brim or the side showing contrasting strips may be used when donning the cap, depending upon the choice of the wearer. The wide turned back brim serves also as a double cap, fitting

Bathing Cap, Bag and Belt

very snugly. This combination is made in red and white, green and white, yellow and white, and dark blue and white, and of heavy pure gum rubber.

A wide striped, short beach jacket with a collar and long sleeves, is also manufactured by this concern, and purchased together with this combination made up in the same colors, makes a very fetching beach ensemble. Coat, suit, shoes, and towel fit into the bag when it is opened.

Tire Discs

AS a result of an analytical compilation of facts and figures just finished by A. Schrader's Son, Inc., valve and gage makers, Brooklyn, N. Y., complete information on the proper air pressure for every size and type of tire used on different makes of automobiles is available at one source. The results of the study are offered in the form of "tire discs" which Schrader furnishes motorists without cost if the latter state the make, model, and year of the car, and the size of its tires.

The discs, made of transfer paper, have been designed to fit on the wheel felloe near the tire valve so they will be in a convenient place when it is necessary to refer to them. They are oval in shape, about 1½ inches long and ¾-inch wide. Once applied, the motorist always knows how much air he should have in his tires, and is not compelled to trust his memory or to take haphazard advice.

Change in Tread Design

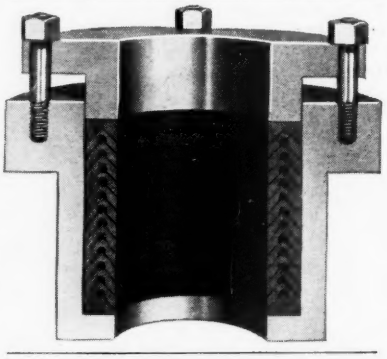
THE Goodyear Tire & Rubber Co., Akron, O., plans a slight change in the tread design of its Pathfinder balloon tire. The design of the diamond is to be completed in the center of the tread. It will not be a block but merely a diamond outline to more closely identify the tire, when it is new, with Goodyear. The work of cutting these diamonds into Pathfinder balloon molds will be done at opportune times when the molds can be spared from production and, consequently, will not be completed for several months.

Goodyear Pathfinder

New Type of Packing

A NEW type of stuffing box packing for the rubber industry is here illustrated. It was designed primarily for use on rams and plungers of heavy duty hydraulic vulcanizing presses, accumulators, and pumps. This packing is automatic in action as it effectively seals under pressure and releases itself when the pressure is off, thus reducing the friction load.

In the illustration of a cross section of a stuffing box, the simplicity of the rings



Garlock Chevron Packing

can easily be discerned. When working against pressure the pockets or hinge allow each ring to spread out against the rod and stuffing-box wall with the pressure acting as an expanding element. Immediately upon release the rings assume their normal position.—The Garlock Packing Co., Palmyra, N. Y.

Obituary

Dean of Rubber Machinery Manufacturers

Alexander Adamson, founder, president, and general manager of The Adamson Machine Co., Akron, O., and prominent civic and industrial leader, died at the Peoples Hospital in Akron on March 3, two days after an operation. His death leaves vacant a place in rubber machinery manufacture that, perhaps, never can be refilled. For, by a lifetime devoted to that work he accumulated a wealth of experience and practical knowledge that has earned for him the title of dean of rubber machinery manufacturers.

On November 20, 1861, at Tonn Hill by Dunfermline, Fifeshire, Scotland, the birthplace also of Andrew Carnegie, Alexander Adamson was born, the son of William and Janet Adamson.

His inclination to things mechanical came from his father, a stationary engineer, who in 1869, when Alexander was 9, emigrated to the United States, and with his family settled in Mercer Co., Pa. At 16, Mr. Adamson, following in the footsteps of his father who taught him the rudiments of the engineering trade, became an engineer for a Palmyra, O., coal mining firm.

Coming to Akron in 1883 he became apprentice machinist at Webster, Camp & Lane Co., and continued in the trade until 1892, when he formed a partnership with a shopmate and organized a new machine shop business. Eight months later, however, his partner sold his interest to Mr. Adamson. Business flourished and expanded under his capable guidance so that today Adamson machinery is a familiar part of Akron rubber factory equipment. Mr. Adamson also secured many patents on rubber machinery.

Grade schools in western Pennsylvania and one term in Ohio State University

Alexander Adamson

provided him with the basis of an education adequately and fully supplemented in the school of life.

Mr. Adamson leaves his widow, Mrs. Flora E. Adamson, whom he married in Palmyra when he was quite young, and two children, Miss Vera Adamson, missionary to the Philippines, who is home on a furlough at present, and Cecil F. Adamson, founder and president of The Adamson Machine Co. at East Palestine.

For 36 years Mr. Adamson was a loyal and devoted member of High St. Church of Christ at Akron. He was a Mason, and a member of the Burns and Akron City Clubs, and the Akron and United States chambers of commerce. He was a former president and director of the Y. M. C. A., and also at various times served on the board of the Y. W. C. A. The Summer Home for the Aged, Hiram College, and the Society For Savings each claimed him a director.

The funeral services held March 6 at High St. Church of Christ were attended by his many friends from all walks of life, including a delegation from Hiram College and the employes of his organization. Among the various messages of tribute received by the Adamson family was that sent by residents of a girls' dormitory built by Mr. Adamson for a missionary college in the Philippines. Burial was in Glendale cemetery.

John Pearce Newman

John Pearce Newman, 53, an employee of The Firestone Rubber Co., died February 25 at City Hospital, Akron, O. Burial was in Rose Hill Cemetery. He is survived by his widow, Mrs. Melrose Newman, and a sister, Mrs. J. W. Vance.

Norman A. Laselle

Norman A. Laselle, for thirty-one years identified with the United States Rubber Co. as a traveling salesman, died February 25, at the Phillips House, Massachusetts General Hospital. He is survived by his widow, Mrs. Mary Fawcett Laselle, and a brother, Beach A. Laselle.

The French Reclaim Industry

As elsewhere, the demand for scrap and reclaimed rubber in France was stimulated by the high prices of crude rubber in 1925 resulting from the operation of the Restriction Scheme. The latest upward trend of the crude rubber market is again favoring increased use of reclaim in the production of tires, insulating materials, and floor coverings.

Material for the reclaiming plants is furnished partly by the old tires from the one million automobiles and several million bicycles circulating in France, old shoes, valves and miscellaneous rubber scrap, and partly by imports of casings from England and Germany, but chiefly from the United States. France is in fact one of America's best customers for scrap. Latest statistics are not available but in 1926 America exported to France 7,595,604 pounds of old and scrap rubber, valued at $608,956.

Although an importer of scrap, France has become an exporter of reclaimed rubber. There are three important reclaiming plants, one of which was started within the last two years. For the three plants, two are in the Seine Department, and one is at Clermont-Ferrand, the total production is estimated at 9,000 metric tons, or 30 metric tons per working day. In addition large companies like Michelin and Hutchinson themselves produce whatever reclaim they may need. France imports small amounts of reclaim from America, the 1926 figures having been 198,054 pounds, value $13,855, but she is exporting a special product to America now running into several tons a month, and much larger quantities to neighboring European states.

Paris prices for scrap rubber follow closely the New York quotations. Local prices on February 27, 1929, were as follows:

	Francs Per 100 Kilos	Dollars Per 100 Lbs.
Automobile Casings		
Beadless, miscellaneous brands	56	1.00
Best brands	59	1.06
Inner tubes, whole red	275	4.91
Grey, floating	315	5.16
Solid truck tires	28	0.55
Cycle tires	20	0.38
Old shoes, soft	16	0.29
Valves, red and white	40	0.72
Valves, black	25	0.45

Prices for reclaim, as given by a manufacturer, are: auto tire casing, black, 30 per cent pure gum, 3 francs per kilo ($0.06 per pound); and inner tubes, 80 per cent pure gum, 8 francs per kilo ($0.15 per pound).

Commission firms and manufacturers are the importers of scrap rubber, and reclaimers purchase the material directly from local or foreign suppliers. Several reclaimers and manufacturers are interested in receiving offers of American scrap rubber. Importers require credit of 45 or 60 days following arrival of ship; terms for local sales are 30 days after the end of the month of delivery. There is no import duty on scrap and old rubber coming direct from America, although these materials are subject to a general gross sales tax of 2 per cent ad valorem.

France Imports Scrap Rubber and Reclaim Duty Free

Under Section 119 of the French customs tariff scrap and reclaimed rubber are assimilated with the crude material of vegetable origin. In keeping with the French tariff policy of favoring the importation of essential raw materials not found in the country, or found in inadequate quantities, no duty is imposed upon such articles coming directly from the United States. They are subject, however, to the general gross sales tax of 2 per cent ad valorem which is collected on imports by the customs administration.

Financial and Corporate News

United States Rubber Co.

To the Stockholders:

The report of the operations of your company for the year ended December 31, 1928, and of the financial condition as of the close of the year, includes, in addition to the subsidiaries heretofore consolidated, Winnsboro Mills, The Beacon Falls Rubber Shoe Co., and The Rubber Regenerating Co., Ltd., of Manchester, England, which companies have previously been carried as investments. This consolidation is made in order more clearly to reflect the operating and financial conditions of your company as a whole.

Operations for the Year

On the consolidated basis, sales for the year amounted to $193,480,121 as compared with $198,089,015 for 1927, a decrease of 2.3 per cent.

Sales of waterproof footwear were considerably lower than for 1927, because of the very unseasonable weather conditions which prevailed throughout the entire country, and especially in the densely populated centers in the East, during November and December as well as during the early months of 1928. Sales of Keds, the popular rubber soled canvas shoe, showed a substantial increase, both in units and value.

Sales of tires, notwithstanding lower selling prices, increased in dollar value over the previous year. Sales of tires to automobile manufacturers for original equipment were appreciably higher in volume. Shipments of cotton cord by Winnsboro Mills, which produces practically all of the fabric used in our tires, increased materially. We start 1929 with an entirely new line of tires, of demonstrated superior quality. The popularity of this new line is already shown in increased demand from car manufacturers and automobile owners.

Sales of belting, packing, hose, molded specialties, etc., although showing an increase in tonnage sold, were slightly less than the previous year in dollar value. Sales of miscellaneous articles, such as golf balls, rubber thread, druggists' sundries, and rubber tiling, showed a satisfactory increase in dollar value and units. Sales in foreign countries through the export subsidiary showed a very substantial and gratifying increase.

The operations of the subsidiaries which supply your company as well as outside customers with chemicals, reclaimed rubber, etc., were satisfactory. The chemical subsidiary and the research department have made rapid strides in the development of several products for use in the rubber industry which should prove of increasing value.

Inter-company sales by subsidiaries are not included in the consolidated sales as reported above, and the profits derived from inter-company sales are not taken into the consolidated earnings of the company until the manufactured articles are ultimately sold to customers.

Consolidated net income for the year after all charges, including depreciation of plants and interest on funded indebtedness, amounted to $4,257,049 before adjustment of the value of rubber in all inventories. This adjustment, most of which was made as of June 30, 1928, amounted to $15,038,304, which caused a net loss for the year of $10,781,255. Earnings were adversely affected by the drastic decline in the market price of crude rubber which occurred during the first six months of the year, making it necessary to adjust the value of rubber in all inventories of finished goods as well as of raw materials from 40 cents per pound at the first of the year to 20 cents per pound at June 30, 1928. This adjustment was fully explained in the chairman's letter covering the first six months of 1928.

United States Rubber Plantations, Inc.

The net earnings of the plantations company for the year reflect the low market price of crude rubber. Notwithstanding the low average price for the year, net earnings amounted to $1,087,680 after liberal reserves for amortization of the cost of development, depreciation of plant and equipment, and foreign income taxes. Profits of the plantations company are taken into the consolidated earnings of the United States Rubber Co., only as dividends are declared by the plantations company.

Your company has long held a preeminent position in the field of crude rubber, and owns and operates the largest rubber plantations in the world, which now produce over 70 per cent of all rubber produced under American ownership. Approximately 24,000 employes are engaged in this work with modern and fully equipped housing, hospitals and sanitation, narrow gage railroad, motor equipment and roads, complete factory and shipping facilities for the preparation of rubber best fitted for our uses, and with a research staff whose scientific work is acclaimed by scientists as well as by the rubber producing industry. Intensive planting was started nearly nineteen years ago and later plantings have been made with stock which will yield even higher returns per acre than the areas now being tapped. The largest plantations unit, consisting of more than 44,000 acres, now yields approximately 550 pounds per acre per annum, which is much greater than the average obtained by the rubber producing industry as a whole.

The plantations comprise a total area of 135,077 acres and are located in Sumatra and Malaya. Of the total area approximately 88,500 acres have been planted, and of the planted area about 59,000 acres are in bearing, including 5,000 acres that became mature during 1928. Production for the year amounted to 28,767,000 pounds, an increase of 3,090,000 pounds over 1927.

The assets and liabilities of United States Rubber Plantations, Inc., are not included in the consolidated balance sheet of the United States Rubber Co., but are shown separately.

Consolidated General Balance Sheet

On December 7, 1928, the stockholders approved the change of the common stock of the company from shares having a par value of $100 each to shares of no par value. Thereafter, 728,412 shares of common stock of no par value were offered to common stockholders at $35 per share, in order to provide additional capital, thus permitting the retirement of indebtedness and at the same time bringing about a larger proportion of common stock in relation to the senior securities of the company. This stock was sold to common stockholders of record as of December 21, 1928, to be paid for on or before January 11, 1929. The Board of Directors believe that this change has been a distinct step in improving the financial structure of your company. In the Consolidated General Balance Sheet as of December 31, 1928, effect has been given to this sale of common stock.

Inventories of crude rubber as of December 31, 1928, were valued at 20 cents per pound, both as to raw materials and the rubber content in finished goods. The average value of all other inventories was at cost or market prices, whichever were lower.

Trade acceptances and drafts against export shipments, discounted by subsidiary companies and outstanding as of December 31, 1928, amounted to $1,267,404.

During previous years, six of the smaller factories of the company have been discontinued as manufacturing units, and during the past year consideration has been given to the consolidation of activities which will permit the closing of additional plants. Provision has been made from the Surplus Account for such adjustments as may be necessary in connection with the disposition of these factories and for the improvement of facilities in certain other units. Provision has also been made for the disposition of obsolete machinery and equipment including obsolete tire molds, as well as for other general contingencies. The amount provided for the foregoing purposes is $10,000,000, as stated in the Consolidated General Balance Sheet.

C. B. Seger, who had served the company as president since January 1, 1919, and as chairman of the Board of Directors since September 1, 1921, resigned on January 15, 1929. On the same date F. B. Davis, Jr., was elected chairman and president to succeed Mr. Seger.

F. B. DAVIS, JR.
Chairman.

1790 Broadway, N. Y.
March 5, 1929.

UNITED STATES RUBBER CO. AND SUBSIDIARY COMPANIES.
Statement of Income and Surplus

Surplus, December 31, 1927, as reported	$40,146,386.72	
Surpluses, December 31, 1927, of subsidiary companies heretofore shown as securities of affiliated and controlled companies on the balance sheet of United States Rubber Co.	1,210,212.76	
Total surplus, December 31, 1927		$41,356,599.48
Net profit from operations for the year 1928, before depreciation of plants, interest on funded indebtedness, and rubber adjustment, but after all other charges	$14,530,711.57	
Provision for depreciation of plants	5,152,726.71	
	$9,377,984.86	
Dividend received from United States Rubber Plantations, Inc.	1,000,000.00	
	$10,377,984.86	
Interest on funded indebtedness	6,097,546.72	
	$4,280,438.14	
Dividends on minority stock of Dominion Rubber Co., Ltd.	23,389.00	
Net income for the year before rubber adjustment	$4,257,049.14	
Adjustment of value of rubber in inventories of finished goods and raw materials	15,038,303.91	
Balance to surplus for the year after all charges (deficit)		10,781,254.77
		$30,575,344.71
Adjustment of Surplus:		
Provision for property and equipment adjustments and other contingencies	$10,000,000.00	
Sundry charges, less credits, applicable to surplus account, including commission and expenses covering sale of 728,412 shares of common stock of no par value	2,568,704.63	
		12,568,704.63
Surplus, December 31, 1928 (subject to final determination of Federal taxes for years subsequent to 1917) as stated in consolidated balance sheet		$18,006,640.08

CONSOLIDATED PROFIT AND LOSS ACCOUNT, YEAR ENDING DECEMBER 31, 1928

Gross sales, less returns and allowances		$60,933,841.21
Cost of sales, including depreciation, selling and administrative expenses, together with reserve against commitments for crude rubber		68,239,090.82
Loss		$7,305,249.61
Deduct—Miscellaneous income		81,497.42
Total loss after depreciation, but before interest		$7,223,752.19
Add—		
Interest on bonds, gold notes, etc.	$1,487,125.64	
Amortization of discount and expenses on issue of 8% bonds	80,373.91	
		1,567,499.55
Loss, carried to surplus		$8,791,251.74

CONSOLIDATED SURPLUS ACCOUNT, DECEMBER 31, 1928

Surplus at December 31, 1927		$11,298,107.28
Deduct—Transferred from profit and loss account		8,791,251.74
		$2,506,855.54
Deduct—		
Dividends Declared		
First preferred stock	$788,597.25	
First preferred convertible stock	234,543.75	
Management stock	787.50	
Second preferred convertible stock	52,262.00	
		1,076,190.50
Surplus at December 31, 1928, carried to balance sheet		$1,430,665.04

Thermoid Company's Financing

In connection with the acquisition of the Southern Asbestos Co., Charlotte, N. C., by the Thermoid Company, Trenton, N. J., it is planned to issue $1,000,000 7 per cent $100 par value cumulative convertible preferred stock, an additional issue of $500,000 five-year 6 per cent sinking fund gold notes with stock purchase warrants, and 85,000 shares of no par common stock. Each share of the new preferred stock is convertible into 3 shares of common stock of the company at any time, unless called for redemption, in which case it may be converted at any time up to within 5 days of the redemption date.

The proceeds from the sale of the notes and stocks will be used to partially reimburse the company for the cost of acquiring a majority of the capital stock of the Southern Asbestos Co.

The outstanding capitalization of the Thermoid Company, upon the completion of this financing will consist of $3,000,000 five-year 6 per cent sinking fund gold notes, including this issue, $2,000,000 of 7 per cent cumulative convertible preferred stock, and 235,000 shares of no par common stock.

New Financing for The B. F. Goodrich Co.

A special meeting of the Board of Directors of The B. F. Goodrich Co. was held March 21, 1929. The directors determined to submit to the stockholders at the annual meeting to be held April 17, 1929, a proposal to increase the number of common shares without par value from 1,000,000 to 1,500,000. Subject to such increase being authorized by the stockholders, 207,728 shares of common stock will be offered for subscription by the holders of its common stock without par value at $81 per share on the basis of one share of common stock for each four shares of common stock held by each, as shown by the records of the company at the close of business on April 3. The right to subscribe expires on April 24, 1929. All subscriptions are payable in cash with the subscriptions.

The proceeds from the proposed sale of common stock are for the purpose of plant construction and development in Georgia, California, Canada, and elsewhere, and to increase the working capital of the company.

The company has contracted to sell the entire issue (207,728 shares) subject to shareholders' approval and subject to stockholders' subscription rights.

This issue will participate in the regular quarterly dividend of $1 per share on the common stock, payable June 1, 1929, to stockholders of record at the close of business May 10, 1929.

Rubber Machinery Pays First Dividend

The National Rubber Machinery Co., Akron, O., on March 6, declared an initial dividend of 50 cents, placing the stock on a $2 annual basis.

Samson Tire & Rubber Corp.

Samson Tire & Rubber Corp., Los Angeles, Calif., reports gross sales for February of $585,482, compared with $460,771 for February, 1928, an increase of 27 per cent.

For the same period the company reports a gain in tire units produced of over 50 per cent, compared with last year. Sales for the year thus far show a gain of 29 per cent in dollars and over 50 per cent in units over a year ago.

The Fisk Rubber Co.

To the Stockholders:

Sales for the year of $60,933,841 compared with $63,281,033 in 1927, reflected lower selling prices. Unit sales for the year exceeded those of 1927 by 16 per cent.

During the year crude rubber prices collapsed as a result of the unexpected announcement in April of the abandonment of the Stevenson Restriction Act. The decline from 42 to 18 cents per pound, forced a downward revision of tire prices and at the time of year when commitments and inventories were at their peak.

As of June 30 we absorbed our losses on crude rubber on hand and in finished inventory, also on crude rubber commitments for delivery in 1928, including our loss in the Crude Rubber Agency, which resulted in total losses for the first six months of $8,483,134. From July 1 to December 31 the company operated at a profit of $691,882.

Your directors as of December 31, 1928, set up a reserve of $1,000,000, thereby bringing all commitments for crude rubber to market prices at that date. Since January 1 crude rubber prices have materially advanced, and your company is now in the satisfactory position of having its raw and finished inventories together with crude rubber commitments at considerably under replacement costs.

To provide for further substantial increased annual dealer sales during the next few years, assured by the largest contracts in our history with automobile manufacturers as a back log, considerable additional capacity was required, necessitating plant expenditures which will be completed April 30 increasing total capacity by approximately fifty per cent in two years. These expenditures result in greater operating efficiency and lower manufacturing costs.

All plants are now operating close to capacity and the outlook for 1929, in view of our sales expansion program, is favorable.

H. T. DUNN.
President.

Fisk Building, New York, N. Y.
March 4, 1929.

Akron Rubber Stock Quotations

March 20, 1929

Company	Bid	Asked
Akron R. R.	20	22
Akron R. R., pfd.	..	95
Falls	6½	8¼
Faultless	..	36
Firestone	272	276
Firestone, 6% pfd.	109⅜	110
Firestone, 7% pfd.	109½	110
General	260	300
General, 6% pfd.	99½	101½
Goodrich	95½	96½
Goodrich, pfd.	112½	113½
Goodrich, 6½s.	107¼	107½
Goodyear	148¼	149¼
Goodyear, 1st pfd.	103¾	104¾
Goodyear, 5½s, 31	99½	..
Goodyear, 5s, 57	91¾	92¼
India, com.	64	65
India, 7% pfd.	85	95
Miller	28	29
Miller, 8% pfd.	78	81
Mohawk	58	59
Mohawk, 7% pfd.	..	90
Rubber Service	..	40
Seiberling	54½	58½
Seiberling, 8% pfd.	104½	108

New York Stock Exchange Quotations

March 21, 1929

Company	High	Low	Last
Ajax	9	8⅞	9
Fisk	16¼	15¼	15¼
Goodrich (4)	96⅞	95	95⅞
Goodyear	146	143½	143⅝
Goodyear, 1st pfd. (7)	104¼	104	104⅛
Intercontinental	11½	11½	11½
Kelly-Springfield	19⅛	18¾	18¾
Lee	21	20⅛	20⅞
Miller	27⅞	26½	26¾
Norwalk	5¾	5¾	5¾
U. S. Rubber	62⅜	60½	60½
U. S. Rubber, 1st pfd.	89	88½	88½

DURING 1928 NEARLY 25,000 PERSONS WERE KILLED AND MORE than 700,000 suffered serious personal injury as a direct result of the failure to adequately cope with the problems of motor car traffic, according to the American Motorists' Association. The total economic loss due to the destruction of property, to congestion, and to other causes incident to inadequate traffic facilities is estimated by the Association to be not less than $2,000,000,000 annually.

Dividends Declared

COMPANY	Stock	Rate	Payable	Stock of Record
Aetna	Pfd.	$1.75 q.	Apr. 1	Mar. 16
Aetna	Com.	$0.25 q.	Apr. 1	Mar. 16
Dominion	Pfd.	1¾% q.	Apr. 1	.....
Faultless	Com.	$0.20 q.	Apr. 1	Mar. 15
Faultless	Pfd.	$1.75 q.	Apr. 1	Mar. 15
General	6% Pfd.	1½% q.	Mar. 31	Mar. 20
Goodrich	Pfd.	1¾% q.	Apr. 1	.....
Goodrich	Com.	$1.00 q.	June 1	May 10
Goodyear (Can.)	Com.	$1.25 q.	Apr. 1	Mar. 15
Goodyear (Can.)	Pfd.	$1.75 q.	Apr. 1	Mar. 15
Mohawk	Pfd.	1¾% q.	Apr. 1	Mar. 15
National Rubber Machinery	Com.	$0.50 in.	Apr. 15	Mar. 20
Seiberling	Pfd.	2% q.	Apr. 1	Mar. 20

National Association of Waste Material Dealers

The sixteenth annual meeting of the National Association of Waste Material Dealers, Inc., was held at the Congress Hotel, Chicago, Ill., March 20 at 2 P.M. The sixteenth annual banquet was held in the Gold Room of the same hotel in the evening of the same date. The various division meetings were also held at the Congress Hotel and occupied three days, from March 19 to 21 inclusive. The attendance and interest shown at these meetings registered the highest in the history of the Association.

The Scrap Rubber Division meeting was held at 2 P.M. on March 19. After the consideration of routine business, general business conditions were discussed. David Feinberg of Boston was reelected chairman of the Division.

Expect Better Tire Export Trade

Although United States exporters of rubber products suffered a temporary decline to $73,410,447 in 1928 from $74,592,867 in 1927, the United States is still the largest producer of rubber goods as well as the most potential exporter. American rubber goods are shipped to all corners of the globe and compete in quantity, and in many instances in price, with the products of other nations. With the continued strengthening of the domestic rubber industry and the phenomenal increase in the popularity of American-made automobiles abroad, United States exporters of tires—accounting for nearly 60 per cent of rubber goods exports—anticipate a better and more prosperous year in 1929.—*U. S. Commerce Reports.*

Rims Approved by Tire & Rim Association

Rim Size	February, 1929 Number	February, 1929 Per Cent	2 Months, 1929 Number	2 Months, 1929 Per Cent
Motorcycle				
24 x 3 CC	.....	...	3,216	0.1
24 x 3 Std.	.....	...	4,200	0.1
26 x 3 CC	.....	...	756	0.0
28 x 3 CC	.....	...	337	0.0
Clincher				
30 x 3½	26,968	1.2	72,507	1.8
18" Balloons				
18 x 4	121,051	5.3	204,745	5.0
18 x 3.25	3,395	0.2	23,472	0.6
18 x 4½	33,718	1.5	54,830	1.3
18 x 5	4,890	0.2	11,714	0.3
19" Balloons				
19 x 2.75	42,090	1.9	65,306	1.6
19 x 3½	74,616	3.3	224,201	5.5
19 x 4	505,333	22.3	803,678	19.6
19 x 3.25	38,074	1.7	64,593	1.6
19 x 4½	81,026	3.6	98,215	2.4
19 x 5	12,296	0.5	15,815	0.3
20" Balloons				
20 x 2.75	506,053	22.3	930,233	22.7
20 x 3½	2,292	0.1	23,822	0.6
20 x 4	231,972	10.2	445,082	10.9
20 x 4½	39,007	1.7	92,642	2.3
20 x 5	57,484	2.5	100,400	2.4
20 x 6	3,472	0.2	20,448	0.4
20 x 6.75 DC	3,184	0.2	3,722	0.1
21" Balloons				
21 x 2.75	20,194	0.9	20,194	0.5
21 x 3½	38,828	1.7	57,815	1.4
21 x 4	5,946	0.3	14,881	0.4
21 x 4½	4,262	0.2	10,114	0.2
21 x 5	543	0.0	543	0.0
21 x 6	1,017	0.0	1,017	0.0
22" Balloons				
22 x 4	350	0.0	350	0.0
High Pressure				
30 x 3½—23	.....	...	6,188	0.2
32 x 4½—23	7,120	0.3	14,726	0.3
32 x 4—24	5,148	0.2	6,376	0.2
34 x 4½—25	1,156	0.1	1,156	0.0
20" Truck				
30 x 5	306,213	13.5	560,895	13.7
32 x 6	35,213	1.6	64,027	1.6
34 x 7	12,182	0.5	22,591	0.6
36 x 8	15,947	0.7	21,089	0.5
40 x 10	304	0.1	304	0.0
22" Truck				
38 x 8	542	0.0	548	0.0
24" Truck				
34 x 5	630	0.0	632	0.0
36 x 6	6,333	0.3	10,885	0.3
38 x 7	2,639	0.1	5,180	0.1
40 x 8	10,676	0.5	12,172	0.3
44 x 10	246	0.0	246	0.0
Airplane				
8 x 3	.....	...	15	0.0
12 x 3	108	0.0	132	0.0
16 x 3½ (24 x 4)	35	0.0	954	0.0
20 x 3½	81	0.0	81	0.0
20 x 4	.....	...	6	0.0
20 x 5	.....	...	2	0.0
20 x 6	117	0.0	334	0.0
20 x 8	174	0.0	389	0.0
24 x 10	109	0.0	109	0.0
18 x 4 Cl.	1,990	0.1	2,346	0.1
Totals	2,265,024	...	4,100,231	...

The Rubber Industry in America

OHIO

Franz Foundry & Machinery Co., Akron, O., recently announced the addition to its sales staff of Matthew "Matt" Klein as Chicago district sales agent. Mr. Klein has had many years of experience with rubber organizations including the G. and J. branch of the U. S. Rubber Co., Indianapolis, Ind., the Federal Rubber Co., Cudahy, Wis., the McClaren Rubber Co., Charlotte, N. C., and the Century Co., Chicago, Ill. His headquarters are at 1822 S. Second St., Maywood, Chicago, Ill.

C. W. Bishop, well-known consulting engineer to the rubber reclaiming industry, is now factory manager for The Akron Rubber Recovery Co., Akron, O. This company plans most modern and up-to-date improvements in equipment and process to insure economical production of staple reclaim as well as special stocks for which there is a growing demand.

Dr. W. F. Zimmerli, one of the rubber technologists covering the Akron district for The Roessler & Hasslacher Chemical Co., 10 East 40th St., New York, N. Y., addressed the Chemistry Club of Akron University on March 15. Dr. Zimmerli organized this club in 1914.

G. A. Wiedemer, service manager of the Seiberling Rubber Co., Akron, O., has been named as vice chairman.

Pharis Tire & Rubber Co., Newark, O., has added to its factory staff J. E. Warrell, formerly production manager and chief chemist of the Carlisle Tire & Rubber Co., Carlisle, Pa.

The B. F. Goodrich Co., Akron, O., in February gave $1,205 in suggestion awards made to employes. The highest award, $150, went to B. D. Shrader, for an improvement in a manufacturing process. The awards, given to 69 persons, ranged from Shrader's prize of $150 down to $5.

Summit County Society of Safety Engineers met March 14 at The B. F. Goodrich Co., Akron, O., for the discussion of static electricity. C. L. Hungerford of the safety department of the Firestone Tire & Rubber Co., discussed interestingly "Static Electricity as the Cause of Fires." H. A. Kieffer of the National Sulphur Co. and T. G. McKenna of the Goodyear safety department took part in the discussion.

Frank R. Henderson, president of F. R. Henderson, Inc., New York, N. Y., and president of the Rubber Exchange, on March 15 at Akron, O., addressed the Shriners Club and officials of Akron rubber companies on "The Crude Rubber Situation."

R. D. McDowell, president, The India Machine & Rubber Mold Co., Akron, O., manufacturer of the India collapsible building core and chuck, reports business excellent in the mold and tire machine industry. Tire manufacturers who keep step with the constantly changing demands of the trade must replace semi-annually their old equipment with new. This condition overtaxes the limited facilities of rubber plant machine shops and the replacement business is reverting to the equipment manufacturers.

The B. F. Goodrich Co., Akron, O., has sold its one-fourth interest in the Continental Rubber Co., of Germany. The association of the two companies began in 1920, when the American organization obtained its share of the control and management of the Continental, to facilitate distribution of Goodrich products in Europe and furnish the Akron industry with a close contact on the crude rubber market of the old country.

Knut Eckener, son of Hugo Eckener, commander of the Graf Zeppelin, will soon leave his home in Germany for Akron, O., where he will be employed by the Goodyear-Zeppelin Corp. Just what position he will occupy has not been announced, but undoubtedly he will be in charge of some part of the construction of the two dirigibles that Goodyear will build for the United States Navy.

B. W. Huling, service manager of The B. F. Goodrich Co., Akron, O., has been elected chairman of the Service Managers' Committee of the Tire Manufacturers' Division of the Rubber Association.

W. E. Fouse, vice president of The General Tire & Rubber Co., Akron, O., is wintering at Miami, Fla., and Havana with Mrs. Fouse.

John "Jack" Flynn, who in a 20-year association with the Williams Foundry & Machine Co., Akron, O., served as superintendent for the last 15 years, has joined the Franz Foundry & Machine Co., Barberton, O., as assistant superintendent.

Chief Engineer of the Goodyear Zeppelin Corp.

In Prague, Czechoslovakia, on March 24, 1887, was born a boy destined to dominate the lighter-than-air industry in aviation—Karl Arnstein. The boy grew older and attended the University of Prague from which he was graduated. He served in the faculty as assistant professor before he received his degree of doctor of technical sciences.

Dr. Karl Arnstein

The young engineer achieved a widespread European reputation for his technique in stress analysis, a record regarded with interest by the airship engineers on Lake Bodensee. He was invited to join that growing organization. In 1914 he became chief engineer of the Zeppelin company, devoting his energies mainly to the development of fundamental principles in airship design with particular reference to the stress analyses of rigid airships and metal airplanes.

Dr. Arnstein, now vice-president and chief engineer of The Goodyear Zeppelin Corp., Akron, O., subsidiary of The Goodyear Tire & Rubber Co., came to the Goodyear organization in 1924 from Friedrichshafen, Germany.

When the Bureau of Aeronautics inaugurated two competitions for designs for military rigid airships of about 6,500,000 cubic feet capacity, Dr. Arnstein set out to win them. He did. In October, 1928, Goodyear was awarded the contract for two ships of this type. Dr. Arnstein will direct construction work at Akron, where the Goodyear Co. will erect a giant airship hangar near its factories on the municipal airport.

Dr. Arnstein is credited also with the principal design of about ninety military and commercial airships including the *Los Angeles.* He has presented a number of scientific papers principally devoted to aeronautics before American engineering societies and has prepared many articles on rigid airships which have been published widely throughout Europe and the United States.

In 1927 Dr. Arnstein received the degree of Doctor of Engineering in the University of Aix-La-Chapelle at Aachen, Germany.

He is married and resides at Akron.

Heads New Goodyear Dixie Rubber Plant

The appointment of Frank A. Steele, heretofore assistant superintendent of the Goodyear plant at Los Angeles, as superintendent of the new Dixie plant of the Goodyear Tire & Rubber Co. at Gadsden, Ala., is regarded not only as a move that will do much to assure the success of the new undertaking but as a good exemplification of the policy of substantially appreciating the services of loyal, capable, and indefatigable executives.

Frank A. Steele

Mr. Steele enters on his task of caring for the new 400-acre $7,000,000 southern works, with its initial capacity of 5,000 tires daily, with not only exceptional experience but the physical advantage of young middle age. He was born in Marshallville, O., May 10, 1884, graduated in 1908 from Wooster University with the degree of bachelor of science, and also won a similar degree in 1910 from Case School of Applied Science.

Starting in 1910 as a chemist in the Goodyear works at Akron, O., he became associated with the production departments in 1911, and soon became department foreman, general foreman, and division superintendent. In 1919 he was transferred to the newly-opened Goodyear plant in Los Angeles, where he accomplished many notable improvements in production. In May, 1928, he was made assistant general superintendent, and last December he was selected for his present important post.

Tire and general rubber manufacturing is still Mr. Steele's chief hobby, and he is content with but simple diversions in his off hours. Few things afford him more gratification than his success in getting on well with his factory aides; and while operatives and executive personnel were much pleased with his promotion they greatly regretted his departure from the Los Angeles works and the ending of ten years' pleasant relations.

Mr. Steele belongs to the Masonic order, the Alpha Tau Omega Fraternity, Sigma Xi, and Tau Beta Pi. His new address is Gadsden, Ala.

Miller Rubber Company Holds Annual Meeting

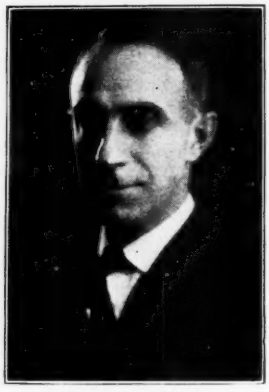
The annual business meeting of the Miller Rubber Co., Akron, O., was held March 14. The number of members of the board of directors was increased from 10 to 12. Jacob Pfeiffer, former president, was elected to the new position of chairman of the board. William Pfeiffer became president and will continue as secretary, treasurer and general manager. The new directors are T. E. Borton of the Borton & Borton Co., and H. W. Hillman of Otis & Co., Cleveland, O. J. O. Eaton of Otis & Co., who was appointed in February, was also reelected. Other directors who were reelected were L. C. Rockhill, C. T. Grant, F. B. Theiss, J. M. Doran, R. T. Griffiths, R. R. Jennings, and H. S. Parker.

L. C. Rockhill was elected vice president in charge of sales, R. T. Griffiths vice president in charge of production, and Frank Fenton factory superintendent.

The annual financial statement showed an operating profit of $612,300 which was subject to adjustments for crude rubber prices, interest, and depreciation. The company closed the year with a deficit of over $2,000,000, including these crude rubber adjustments and charging off $977,000 for depreciation.

General Executive Is Production Expert

Charles J. Jahant, vice president and director of General Tire & Rubber Co., Akron, O., has long been regarded as one of the tire industry's production experts, and wholly through exceptional ability and close application has advanced steadily in his chosen line. Born in Akron, O., June 19, 1885, he was well grounded in the fundamentals in the city schools, and won with special distinction in 1909 a bachelor of science degree at Buchtel College, where he also learned much about rubber engineering.



Chas. J. Jahant

He got his first factory experience with the Firestone Tire & Rubber Co., Akron, being night superintendent in 1911-13 and assistant superintendent in 1913-15. In 1915 he accepted the superintendency of the General company's plant and soon took entire charge of production. Next he was made a director and vice president, and has continued in those offices as a forceful member of General's strong personnel.

In addition to his position in the General company management, Mr. Jahant is a director of the Ohio State Bank & Trust Co., Akron. He is a member of the Akron City, Akron University, and Portage Country Clubs. His address is 655 N. Portage Path, Akron, O.

SOUTHERN

James D. Tew, president of The B. F. Goodrich Rubber Co., Akron, O., has announced plans for a third Goodrich plant in the United States, to be completed at Atlanta, Ga., by the end of this year. The announcement follows the purchase of 25 acres of land at 14th and Hemphill Streets, Atlanta. Construction will be started in the near future. Production will total 5,000 tires and 5,000 tubes a day.

With the acquisition of the Martha Mills at Thomaston, Ga., the first of this year, Goodrich will have made investments in the South to the total of more than $7,500,000 when the Atlanta plant is completed. The capacity of the cord mills at Thomaston will be more than doubled when the present program of expansion has been completed. The original equipment of 30,000 spindles will be increased to 80,000, making this the largest plant of its kind in the South.

Several hundred acres of land in the vicinity of the mills have been purchased and the building program includes about 500 modern homes for mill employes. The little city has been named "Silvertown."

The Goodyear Tire & Rubber Co., Akron, O., announces the appointment of three employes to executive positions at the new Gadsden, Ala., plant. J. C. Mangles will be in charge of the compounding, the chemical and physical laboratories, and fabric testing. Bert Morgan will head the production flying squadron; and O. A. Roberts will have charge of the compound room.

The Goodyear Tire & Rubber Co., Akron, O., in connection with its new tire and tube plant at Gadsden, Ala., has approved plans for a multi-story rubber reclaiming mill, 100 by 380 feet, on an adjoining site, to cost about $1,000,000 with machinery. It will have a daily capacity of 26 tons of reclaimed rubber, most of which will be sent to the mechanical goods plant in Akron.

Firestone Tire & Rubber Co., Akron, O., has awarded a general contract for factory branch, storage and distributing plants at Jacksonville, Fla., to cost about $185,000 with equipment. Work will soon begin on a similar unit at Miami, Fla., to cost a like sum.

NEW ENGLAND

The Converse Rubber Co., a new Massachusetts corporation which has bought the assets of the Converse Rubber Shoe Co. from the Converse Holding Co., is conducting the business along the same lines as its predecessor. Following are the officers of the new company: M. B. Kaufman, president; M. L. Patterson, vice president and general sales manager; F. R. Allen, treasurer and comptroller; and A. W. Wechsler, clerk. Other executives are L. D. Ackerman, technical manager; E. F. Casey, factory manager; R. C. Kelley, production manager and general purchasing agent; and L. P. Sanborn, cost accountant.

Tire Fabric Corp. has been formed to lease and operate the cotton mill at Salmon Falls, N. H., formerly occupied by the Salmon Falls Manufacturing Co. The new company will operate to full capacity with a full day and night force and will make tire fabric. It is estimated that approximately 525 hands will be employed and the annual payroll will aggregate half a million dollars. The officers are: president, E. H. Shurtleff; vice president, Theodore Wood; and treasurer, Andrew G. Pierce, 3d.

Mr. Shurtleff for some years has been prominent in the tire fabric industry, having been also sales agent of the Beaver and Traynor Mills. Mr. Wood was connected with several New Bedford cotton mills. and also The Goodyear Tire & Rubber Co. Later he conducted a brokerage business in rubber.

George Luce, for many years in tire-fabric manufacture, is superintendent in charge of the operation of the mill, and Frank Fyans is to supervise present equipment. Additional equipment is being installed.

The Boston Automobile Show held at Mechanics Building, Boston, Mass., early in March attracted considerable attention. Exhibitors all agreed that in leads and actual sales it was one of the most profitable shows they had held. Practically all the large tire manufacturers were represented by exhibits of their main Boston distributers. The Eastern Rubber Products Co., Inc., Philadelphia, Pa., made a special drive featuring a Magic Rubber Mend. The Safety Clear Vision, Inc., Fitchburg, Mass., introduced a new rubber windshield device. The various rubberized auto-top equipment companies also had excellent exhibits.

N. Lincoln Greene, vice-president of Clifton Manufacturing Co., 65 Brookside Ave., Jamaica Plain, Boston, Mass., manufacturer of rubberized clothing, has returned from a business trip to the western coast.

United Shoe Machinery Corp., 205 Lincoln Street, Boston, Mass., will soon start work on a new eight-story and basement warehouse at South Boston, 125 by 150 feet, for which portable handling equipment is required. French & Hubbard, 210 South Street, Boston, are engineers.

The United States Rubber Co., announces that the L. Candee & Co., footwear plant at New Haven, Conn., will discontinue manufacturing operations on April 6. However, the laboratory, machine shop, and engineering operations conducted there for the mechanical and footwear factories, will be continued. The Boston Rubber Shoe Co.'s Fells plant at Melrose, Mass., will also close on April 6. Production of the New Haven and Melrose plants will be distributed among the remaining plants of the U. S. footwear division.

The Everlastic, Inc., rubber goods manufacturer, at Spencer and Webster Avenues, Chelsea, Mass., lost several thousand dollars when a fire broke out recently in its printing department. Most of the damage was caused by smoke and water, especially the water from the several hose lines that leaked into the basement where the surplus stock was kept. The fire itself was quickly extinguished before many of the 500 employes at work in the building knew that a fire had been raging.

Col. C. M. Piper, formerly sundries' sales manager of The Goodyear Tire & Rubber Co., Akron, O., has been appointed special assistant to the sales manager of The Fisk Rubber Co., Chicopee Falls, Mass., where he will make his headquarters.

New England Butt Co., Providence, R. I., manufacturer of rubber machinery, is working at about 75 per cent of capacity and expects to increase operations.

The Auto Supply Co., Taunton, Mass., retailer of automobile tires, lost seven thousand dollars when a fire caused by an explosion from a water heater almost completely wrecked the whole block in which the store is located.

Frederick Hitchcock of the Hanover Rubber Co., Boston, Mass., was married recently to Miss Florence Shea of this city.

David A. Childs of Reading, Mass., for the past six years in charge of the sales promotion work for the Hood Rubber Products Co., Watertown, Mass., has taken over the position of sales manager for the M. A. Packard Co., shoe manufacturers.

Charles A. Cleveland, formerly connected with The B. F. Goodrich Rubber Co. in their footwear department both at the New York and Boston offices, has recently accepted the position as sales manager for the West End Thread Co., Boston, Mass.

Goodyear Production Nears 100,000 Tires Daily

According to President P. W. Litchfield of the Goodyear Tire & Rubber Co., Akron, O., the tires produced by all the Goodyear factories now total almost 100,000 a day. He gives the average production as follows: Akron 70,000, Los Angeles 13,000, Canada 10,000, England 2,500, and Australia 1,500. A substantial addition to the total will be made when the new Goodyear factory at Gadsden, Ala., gets into production this summer.

Rubber Association Statistics for January

Tire manufacturers in the United States produced a total of 6,722,040 pneumatic casings during the month of January, according to estimates issued by the Rubber Association of America, Inc. Total production of inner tubes is estimated at 6,517,242 and total production of solid and cushion tires at 42,569 for the month.

Total shipments during January are estimated as follows: pneumatic casings, all classes, 6,626,196; inner tubes, 7,241,673; solid and cushion tires, 44,716.

Inventories as of January 31, 1929, are estimated as 13,712,210 for all pneumatic casings; 15,385,993 for inner tubes; and 200,740 for solid and cushion tires.

The Association's estimates are based on reports furnished by manufacturers who produce approximately 75 per cent of the total for the United States.

A FIVE-DAY SUPPLY OF CRUDE RUBBER IN THE WAREHOUSE OF THE GENERAL TIRE & RUBBER CO., AKRON, O.

EASTERN

The New Jersey Zinc Sales Co., Inc., 160 Front St., New York, N. Y., announces the appointment of Bruce R. Silver as manager of technical service to succeed E. W. Boughton. Mr. Silver has been with the organization for a number of years. Prior to this connection he was chief chemist for the Dunlop Tire & Rubber Co., Buffalo, N. Y. L. H. Trott and V. A. Belcher have been appointed assistant managers of technical service

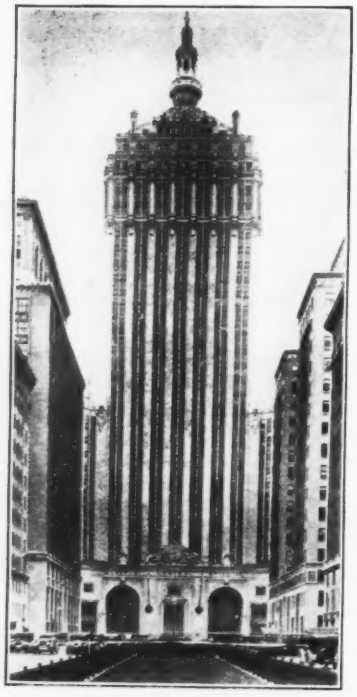
Habirshaw Cable & Wire Corp., 233 Broadway, New York, N. Y., with mills at Yonkers, N. Y., Nepperhan, N. Y., and Bridgeport, Conn., manufactures insulated wires and cables of all descriptions.

E. W. Boughton, formerly with The New Jersey Zinc Sales Co., Inc., 160 Front St., New York, N. Y., is now with R. T. Vanderbilt Co., Inc., New York Central Building, 230 Park Ave., New York, N. Y.

M. F. Behar, formerly advertising manager with C. J. Tagliabue Mfg. Co., now holds a similar position with the Quigley Furnace Specialties Co., Inc., 26 Cortlandt St., New York, N. Y.

Stanley D. Hopkins, advertising manager of A. Schrader's Son, Inc., Brooklyn, N. Y., is receiving congratulations on the arrival of a daughter, Joan Florence Hopkins.

Dr. W. F. Zimmerli of the Roessler & Hasslacher Chemical Co., New York, N. Y., on Feb. 14 and 15, attended, as representative of the Polytechnic Institute of Brooklyn, the inauguration of Dr. Edmund Davison Soper as president of Ohio Wesleyan University, Delaware, O.



NEW YORK CENTRAL BUILDING. OFFICES OF R. T. VANDERBILT CO., INC.; AND U. S. RUBBER RECLAIMING CO.

The Fine Rubber Co., Boston, Mass., rubberizer and manufacturer of single and double texture rain clothing, announces the opening of a New York sales office and show room in the Greeley Arcade Building, 132 W. 31st St., New York, N. Y.

J. P. Fleming, well known in the rubber chemical industry, is now with J. Lee Smith & Co., 19 Jacob St., New York, N. Y.

Stewart-Mathesius, Inc., personnel agency has removed to 274 Madison Avenue, Suite 601. Frank Y. Stewart is president.

A. Schrader's Son, Inc., valve and gage makers, Brooklyn, N. Y., is conducting a nation-wide display contest with cash prizes totaling $1,000. Any dealer selling Schrader products is eligible. Two types of awards are being offered—national and regional. The dealer who arranges the best window, counter or other display of Schrader products wins $250. Second prize is $100, and third, $50. Regional awards, of which there are 18, are $25, $15, and $10 respectively. In addition there are 10 honorable mention awards of $5 for each of the six regions. The contest, which has already begun, will end May 15.

The National Association of Purchasing Agents will hold its annual convention at the Hotel Statler, Buffalo, N. Y., June 3-6 inclusive.

Ludwell H. Gilmer, founder of the L. H. Gilmer Co., Tacony, Philadelphia, Pa., has severed his connection with that company, except as a director, to head a new company, the Gilmer Corporation. It will have headquarters in Detroit and a factory at Auburn, Ind., where production will start April 15 on automobile fan belts and other molded rubber products.

R. T. Vanderbilt Co., Inc., announces the removal of its offices from 50 East 42nd St., New York, N. Y., to the 17th floor of the New York Central Building, 230 Park Avenue, New York, N. Y.

The Roessler & Hasslacher Chemical Co., specializing in chemicals and service to the rubber trade, has announced the removal of its offices from 709 Sixth Ave., New York, N. Y., to 10 E. 40th St., New York, N. Y. They will occupy three floors of this new 44-story landmark.

The U. S. Rubber Reclaiming Co., manufacturers of standard qualities of reclaims, will remove their offices April 8 from the Pershing Square Building, 100 East Forty-second St., New York, to the newly completed New York Central Building, 230 Park Ave., New York. In their new location the company will occupy rooms 1829 to 1838 situated in the southeast corner of the 18th floor. The increased space occupied will be devoted to the accounting department.

E. I. duPont Takes Over Important Grasselli Products

E. I. duPont de Nemours & Co., Dyestuff Department, Wilmington, Del., beginning March 1, takes over the sales of accelerators, antitoxidants, laboratory apparatus and carbon black formerly sold by the Grasselli Chemical Co. The rubber chemicals section will be in charge of H. H. Replogle as sales manager and E. R. Bridgwater as assistant sales manager. Orders and correspondence for the Grasselli products should be sent to Mr. Replogle at Wilmington or the nearest branch office in New York, Boston, Chicago or San Francisco. Correspondence regarding technical matters and application of rubber chemicals should be addressed to Mr. Bridgwater.

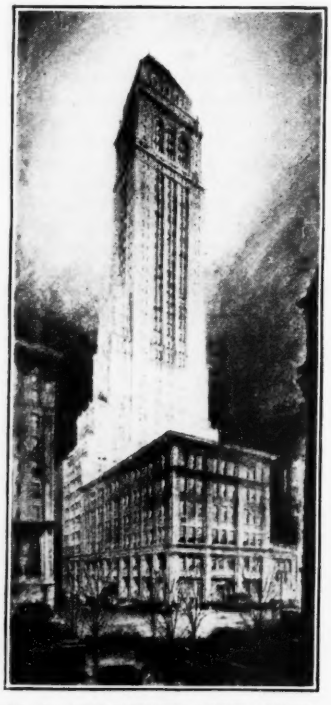
Orders and correspondence concerning lithopone and litharge should continue to be addressed to The Grasselli Chemical Company, Guardian Trust Building, Cleveland, O.

Cutler-Hammer Announces Changes in Organization

P. S. Jones is now manager of the New York office of Cutler-Hammer, Inc., manufacturers of electric motor control and allied apparatus. Mr. Jones was formerly manager of the Pittsburgh office.

T. S. Towle, formerly a sales engineer of the Pittsburgh office, becomes manager at Pittsburgh.

G. E. Hunt has been placed in charge of distributors' sales for Cutler-Hammer.



10 E. 40TH STREET, NEW YORK. OFFICES OF ROESSLER & HASSLACHER CHEMICAL CO.

Cycle Trades Leader Promotes Good Will

Marcel H. Tisne, manager of manufacturers' accessories sales and an executive of the noted tire valve and gage manufacturing concern of A. Schrader's Son, Inc., and recently elected president of the Cycle Trades of America, Inc., has long been distinguished as an adroit "trouble shooter." He is one of the original Boosters, an organization which has perhaps more than any other single agency frustrated friction and promoted good will in the automotive field for many years; and his new rôle will afford him still greater opportunity to be of service in composing difficulties, as he must supervise the many activities of the allied bicycle and motor cycle companies of the United States.

M. H. Tisne

Mr. Tisne was born in New Orleans, La., March 9, 1883, but at an early age went to New York City, where he was educated in the grammar schools, DeWitt Clinton High School, College of the City of New York, and Fordham University, from which he graduated in 1905. After spending three years as sales representative for an importing house, in 1908 he joined the Schrader force and has remained in that organization ever since in various important positions.

Always fond of active sports, Mr. Tisne is well known as a tennis player, and has taken part in several tournaments. For four years as a member of the Hockey Club of New York he won honors at the old St. Nicholas Rink. He is a member of the U. S. Power Squadron, has been active in motorboating for twenty years, and has been commodore of the Audubon Yacht Club and the Tamaqua Yacht Club. His address is 470 Vanderbilt Ave., Brooklyn, N. Y.

Direct Motor Service

An efficient and prompt delivery service to all points between Philadelphia and Boston is given by The Florio Forwarding Co., New Haven, Conn. Its fleet of 45 trucks makes overnight, door-to-door through service and following-day deliveries between Philadelphia, New York, New Haven, Providence, Springfield, and Boston.

NEW JERSEY

There has been little change in the rubber situation in New Jersey during the past month with the exception of a slight decrease in the production of tires and tubes. Manufacturers claim that this is owing to the arranging of "spring dating" between makers and dealers. When this is completed manufacturers look for better buying. The output of mechanical rubber goods remains good, while orders for rubber tiling and brake lining are on the increase. Hard rubber production remains normal. The cut in the prices of tires is also expected to result in increased production.

One Trenton, N. J., tire manufacturing concern has reduced the prices of its products in order to meet the prices offered by the mail-order houses. Many autoists drove out of town and purchased mail-order-house tires; so the Trenton factory decided to offer tires at the same price. The Ford size high pressure casings are now being sold here for less than $6 and tubes run as low as $1. Retail stores in Trenton also have dropped their prices. With the cut now in effect, prices this coming summer are expected to be the lowest in the history of the trade. Sears, Roebuck & Co., Chicago, Ill., are building a three-story establishment in Trenton, and this will result in prices of tires remaining low.

Trenton tire manufacturers are interested in the efforts to place a duty on imports of materials used in the manufacture of their products. The proposed duty on cotton with a staple of 1 1/16 inches or longer will afford no real protection for the American producer and will prove a burden on the tire industry and users of automobiles, it was stated by the Tire Manufacturers Division of the Rubber Association of America.

Thermoid Company, Trenton, N. J., has recently contracted to acquire approximately 51 per cent of the entire outstanding capital stock of the Southern Asbestos Co., Charlotte, N. C. The number of shares to be acquired is to be not less than 50,050 and not more than 51,000. The Thermoid Company is a large user of the products of the Southern concern, and the unification of their interests is expected to be of considerable benefit.

The Goodyear Tire & Rubber Co., Akron, O., has started work on the erection of a three-story building on South Eighth St., Newark, N. J. This will provide 20,000 square feet for storage and shipping purposes.

The Capital Rubber Co., Trenton, N. J., manufacturer of druggists' sundries, to enlarge its facilities has purchased the plant formerly used by the Trent Rubber Co., also of Trenton. The transaction was made through the Mechanics National Bank, which held an equity on the Trent Rubber Co. The price was not given, but it was reported that the holding price was $100,000. A. M. Youngs is at the head of the Capital company.

Whitehead Bros. Rubber Co., Trenton, N. J., reports that business is good in all departments. The concern has been running to capacity for some time.

The Woven Steel Hose & Rubber Co., Trenton, N. J., announces that business is normal and that the prospects for the coming summer are very good.

The Combination Rubber Co., Trenton, N. J., reports that business conditions are good for this season of the year.

The Luzerne Rubber Co., Trenton, N. J., states that business has been steady during the past several weeks, with some lines showing an increase.

Harry W. Roberts, head of the Pierce-Roberts Rubber Co., Trenton, N. J., announces that his concern is enjoying the usual amount of good business.

John Sands Broughton, former president of the United & Globe Rubber Co. and the Globe Rubber Tire Manufacturing Co., Trenton, N. J., who was recently operated on at the Princeton Hospital, is slowly recovering.

Bruce Bedford, president of the Luzerne Rubber Co., Trenton, N. J., and Mrs. Bedford have returned from a trip to Nassau, West Indies.

Fred C. Gladstone, of the Gladstone Tire Co., Trenton, N. J., visited the plant of The B. F. Goodrich Co., Akron, O.

C. Dudley Wilson, secretary of the Luzerne Rubber Co., Trenton, N. J., has returned with Mrs. Wilson from a month's cruise through the West Indies.

The Manhattan Rubber Manufacturing Co., Passaic, N. J. will erect a two-story brick addition to its present plant. The company also plans to put up a steel structure for storage purposes and a garage for its automobiles and trucks.

The Ferracute Machine Co., Bridgeton, N. J., manufactures presses and dies for cutting rubber. Percival H. Smith is president, Henry A. Janvier, vice president, and Enos Paullin, secretary and treasurer.

The Public Library of Newark, N. J., has on file old numbers of the INDIA RUBBER WORLD as part of the Engineering Index Service, thus making information on rubber accessible to anyone who desires it.

The Puritan Rubber Co., Trenton, N. J., is installing new equipment that will double the capacity of the plant. The company has plans under way for the erection of a three-story plant addition that will give about 12,000 additional feet of floor space. The new building will cost about $20,000. The company is rushed with orders for rubber tiling and mats.

FOR EVERY THREE NEW CARS PURCHASED by the public last year two used cars were scrapped, says the American Motorists' Association. The total number of new cars sold in 1928 was 3,220,000 and the number of old cars scrapped during the year was 2,213,000.

PACIFIC COAST

Willard Storage Battery Co., Cleveland, O., which produces 15,000 threaded-rubber batteries a day, may be the next great concern manufacturing automotive essentials to establish a branch factory on the Pacific Coast. It has taken an option on a large tract in the Central Manufacturing District, Los Angeles, and its officials will decide within a month whether or not a factory will be erected. Tentative plans now call for a structure costing about $700,000. Only a few months ago the company established a direct factory branch in Los Angeles through its purchase of the Western Auto Electric Co., 1601 S. Hope St. F. G. Teufel, formerly assistant sales manager at the Willard factory in Cleveland, is in charge of the new branch.

Goodyear Tire & Rubber Co., Los Angeles, Calif., while not expecting to duplicate soon its record run of 18,043 tires and 18,127 tubes made in 24 hours late in February by 2,617 operatives, is, however, scoring a daily average in excess of 13,000 tires and about the same number of tubes. A year ago the average was below 10,000 tires daily. Increasing demand in the eleven far western states and in trans-Pacific markets, it is stated by General Supt. E. L. Thomas, requires a production schedule that is likely to rise steadily up to next fall. Recent visitors at the plant were President Paul W. Litchfield of the parent Goodyear company at Akron; L. Tomkinson, production executive; and H. D. Hoskin, fiscal comptroller, also of Akron. The annual meeting of the Goodyear California stockholders will be held April 4.

Pioneer Rubber Mills, San Francisco, Calif., reports business for the first quarter of 1929 in excess of that for the first three months of 1928. The big factory at Pittsburg, Contra Costa county, Calif., is working at full capacity, the garden hose department being especially rushed with orders. Domestic sales of hose are not only unusually good, but foreign business in that line is continually growing despite eastern and European rivalry. Sales are also reported very good in heavy belting, packing, heels, battery jars, and reclaimed rubber, much of the latter being exported to Europe.

Cactus Manufacturing Co., according to General Manager C. J. Evans, is now making a score of automobile accessories besides its patented studded tire boots at the factory, 914 E. 59th St., Los Angeles, Calif. A distributing branch is maintained at Cincinnati.

Clyde E. Lowe, head of the Clyde E. Lowe Co., rubber machinery manufacturer, Cleveland, O., was a recent guest of leading rubber factory executives in San Francisco and Los Angeles. He returned home by way of Gadsden, Ala., where he inspected the new Dixie plant of the Goodyear company.

Griffith Rubber Mills, Portland, Ore., has installed a new roll grinder, which, with other equipment recently added, enables the mills to do not only original roll covering for the northwest paper mills, but also recovering for mills in that section. Several new mills of exceptionally large capacity are about to be added to the many paper concerns in the Northwest. The grinder, valued at $12,000, and the first of its kind to be set up west of Chicago, grinds a plane or crown face on any roll up to 176 inches.

Pacific Service Dirigibles

Goodyear-Zeppelin Ships for Regular Trips Between West Coast and Orient

Fast passenger, mail, and light express service across the Pacific, and between California and the Hawaiian and Philippine Islands, will be provided with dirigible balloons within about three years, according to President P. W. Litchfield of the Goodyear-Zeppelin Corp. Actual work on the lighter-than-air craft to be used in such service will be begun immediately on completion of the two huge dirigibles recently ordered by the United States government for the Navy.

After building over 100 dirigibles and studying results obtained also by other makers of similar craft, Mr. Litchfield says the Goodyear-Zeppelin Corp. is thoroughly convinced that this type of vehicle is ideally suited for long-distance travel over seas as well as long land stretches. While a transoceanic liner may make something over twenty miles an hour, the dirigible of the Graf-Zeppelin type can make from sixty to eighty miles an hour, and can fill a need for which an airplane is quite unsuited, although the latter has a great field of usefulness.

After getting its Pacific service established, the company plans to have dirigible routes between the United States and various South American points. Already, it is pointed out, Germany is building larger dirigibles than the Graf-Zeppelin for use between that country and points on the Mediterranean, and Great Britain is building super-dirigibles for service between England, Canada, India, and Australia. Other countries abroad are also planning such craft.

The company has leased from the Federal government a part of the army balloon field at Arcadia, Calif., and will there begin the assembling about June 1 of a sister ship of the dirigible Puritan. It will be 128 feet long, 37 feet in diameter, have 86,000 cubic feet gas capacity, will hold four passengers, and have one operator. It will be used chiefly for developmental purposes, training pilots, and for short flights. As in four other dirigibles being made on the Puritan model, it will be buoyed up with helium gas.

Pacific Goodrich Rubber Co. branch managers in the eleven states served by the new concern, and headed by San Francisco District Manager F. F. Harkins, were recent guests of the parent Goodrich company in Akron. They were accompanied by Jay Smith, manager of pneumatic tire sales, and E. W. Show, manager of the specialized sales department. Another unit has just been opened at the new factory in Los Angeles, and with its improved equipment of tire-building machines, vulcanizing heaters, etc., will soon largely increase the output beyond the present daily average of 4,500 tires.

What is said to be one of the largest single shipments of tires sent out of the port of Los Angeles was made recently by the factory via the Dollar Line. The anniversary of the production of the first tire was celebrated by the employes with a supper and dance at the Los Angeles plant on the evening of March 16.

United States Rubber Co.'s former president, C. B. Seger, while visiting recently on the Coast, was a guest of General Manager J. B. Brady of the Pacific Coast Division, San Francisco, and Branch Manager J. B. Magee at Los Angeles. Company executives who have recently visited points on the Coast have included Wm. Kearns, factory manager at Detroit; C. J. Butler, second vice president; C. G. Downs of the Naugatuck Chemical Co., Naugatuck, Conn.; and E. C. Conlin, manager of production and sales of golf balls, Providence, R. I. Mr. Brady has been recently in the southwest section conferring with Mr. Magee. Other visitors to that section have been these coast division heads: W. H. Gilbert, treasurer; H. A. Farr, manager of tires; E. H. White, supervisor of footwear; L. B. Hitchings, supervisor; and H. B. Chandlee, manager of clothing. Harold B. Grimm and Allan Lamm have been added to the clothing sales force of the Los Angeles branch, and C. J. Noonan, who had charge of footwear and clothing, has been transferred to San Francisco.

Firestone Tire & Rubber Co. of California, Los Angeles, despite continual additions to equipment and a steady increase in the working force, finds it hard to meet the rising pressure of orders from the sales organization reaching through the territory between the Midwest and the Coast, according to Vice President and General Manager R. J. Cope. The new plant is now in fine working order, and nearly all machinery ordered has been installed. From now on, Mr. Cope says, there will be a steady stepping up in tire and tube output. He recently had as guests at the factory E. W. BeSaw, vice president and general manager of the Firestone Tire & Rubber Co., Ltd., Hamilton, Ontario, Can., and Wm. A. Baker, vice president and general manager of the Firestone Steel Products Co., Akron, O. The Firestone company is erecting a $200,000 warehouse at Phoenix, Ariz., to serve Arizona, New Mexico, and the Mexican west coast.

Samson Tire & Rubber Corp., Los Angeles, Calif., is making rapid progress with the erection of its big new plant. The grounds have been graded, concrete foundations laid, and most of the steel framework of the main buildings is in place. Both the Compton and San Diego factories are working three shifts daily, but find it difficult to keep up with orders. Hence work on the new factory will be rushed.

Samson branch managers from all parts of the United States recently held a three-days conference at the home office in Los Angeles under the supervision of B. F. Schleicher, executive vice president. W. W. Drum, director of sales, presided. The visitors were addressed by President and Founder A. Schleicher, who, at the close of the conference, tendered them and the home office executives a banquet.

American Rubber Manufacturing Co., Oakland, Calif., has during the past few months installed over $60,000 worth of new machinery and rearranged much of its plant to keep pace with its growing business. Among recent sales of heavy belting was one of 769 feet of 36-inch conveyor belt to the Reliance Rock & Gravel Co., Azusa, Calif., to replace a similar one installed by the American company 4½ years ago. Considerable sales are also reported of oil suction and discharge hose to southwestern refining plants, and large orders for fire hose have lately been filled for Arizona and Southern California cities.

President N. S. Dodge recently returned from a trip to New York, having been called East by the death of a sister. General Sales Manager Wm. R. Goudie has lately been making a business tour of Oregon, Washington, Utah, and Arizona. Charles Everett, specialist in rubber goods for oil fields, has recently been appointed to assist Southern Branch Sales Manager J. Wright Ihlenfeld in Los Angeles. Increased attention is being given to foreign business, several large shipments of heavy oil hose having lately been made to South America. The company also makes linen fire-protection hose and a specially-woven retreaders' sandbag, invented by President Dodge.

Kirkhill Rubber Co., 5811 S. Hoover St., Los Angeles, Calif., which manufactures a wide range of rubber specialties, has, according to General Manager and Treasurer T. Kirk Hill, been progressing consistently, sales for the first quarter of 1929 being quite above those for the same period in 1928. All departments are working 24 hours a day. A. M. Elliott, for seventeen years with the Goodrich works in Akron and who became superintendent of the Kirkhill plant two months ago, recently suffered a breakdown due to a heart attack and has been recuperating at Palm Springs, Calif.

Howard Middleton, president of the Goodyear Rubber Co., 539 Mission St., San Francisco, Calif., has been laid up at his home for the past few weeks with a broken knee.

MIDWEST

Gillette Rubber Co. Increases Capital Stock

Gillett Rubber Co., Eau Claire, Wis., at a meeting of the stockholders on March 15, authorized the change of the outstanding par value common stock to shares without par value, and approved an increase of 100,000 shares of capital stock and a plan for underwriting 60,000 of these new shares and offering the remaining 40,000 to stockholders for subscription. The plan also called for listing the common stock on the Chicago Stock Exchange.

The purpose of this increase in capital is to provide for increased business by the addition of new buildings, the expansion of present buildings, and the addition of new machinery and equipment. These changes will increase the capacity of the plant to 18,000 inner tubes daily and 10,000 automobile tires daily, besides other products of the company.

The organization has been operating three eight-hour shifts for the past 3½ years, and has shown a steady increase in production since 1925. It is the largest producer of bicycle tires in the United States.

Executives are: Frank C. Hermann, president; R. W. Hutchens, vice president and factory manager. The directors include F. C. Hermann, R. B. Gillette, R. W. Hutchens, and S. G. Moon, all of Eau Claire; Wm. Kootz, of Milwaukee; John Rossi, of St. Paul, and Howard D. Whitehouse, A. L. Martin, and Irwin T. Gilruth, all of Chicago.

The Eagle-Picher Lead Co., Joplin, Mo., is said to be contemplating an addition to its smelting plant at Ontario, Okla., which with equipment will cost about $100,000.

The Akron Rubber Reclaiming Co., Barberton, O., announces that A. R. Brandt has joined its sales department.

A. R. Brandt

Mr. Brandt, besides operating a manufacturing plant at Akron, was with the Cudahy plant of the Fisk Tire & Rubber Co., Inc., Chicopee Falls, Mass., and more recently was sales manager of the Rubber Recovery Co.

V. A. Gillies, formerly production superintendent of the golf ball department, Dunlop Tire & Rubber Co., Buffalo, N. Y., is now superintendent of the Bon-Dee Golf Ball Co., Detroit, Mich.

The LaCrosse Rubber Mills Co., Indian Hill, LaCrosse, Wis., is planning two additions to its plant, comprising a main 4-story unit 80 by 160 feet to be equipped for general production, cutting, etc., and a 2-story factory 74 by 100 feet for vulcanizing and finishing operations, that will cost over $100,000.

Chanslor & Lyon Tire & Rubber Co., maker of C. & L. tires, Oakland, Calif., reports sales very good so far this spring and a promising summer trade. The company makes about 85 per cent of the standard sizes of balloon tires and markets them through its many automobile accessory stores on the Pacific Coast. Other products are tubes and radiator hose. Factory Supt. Harry G. Blanchard has tendered his resignation to take effect April 1. His successor has not yet been announced.

Tiretona Products Co., 170 N. Glendale Blvd., Los Angeles, Calif., has been incorporated as the Tiretona Co. with a capital of $20,000. F. J. Schenck, formerly of New York, will remain as superintendent, and associated with him will be E. S. Green, J. R. Porter, C. C. Hewitt, and C. L. Belt. For eight years the concern has been making a liquid preparation to liven and preserve tires, rubber belts, etc.

The Gates Rubber Co., 999 S. Broadway, Denver, Colo., has almost finished the latest addition to its large plant, a one-story 83 by 125-foot mill, which, with its fine equipment, will cost about $100,000.

Goodrich Silver Fleet

The Goodrich Silver Fleet of The B. F. Goodrich Co., Akron, O., is piloted by 19 young college men, who are exploring the nation's highways and byways in their quest for a complete knowledge of tires from every angle. At Akron these men were trained in salesmanship. During their training year they were taught also the fundamentals of tire construction. Now, on the road under all conditions they are learning by practical experience the service tires must give.

"If we continue to bring young men into the organization, of good character and well trained, we need not fear for the future of the rubber industry," said President J. D. Tew of Goodrich.

THE AUTOMOTIVE INDUSTRY USED 814,000,000 pounds of rubber, or 85 per cent of the total rubber output, during 1928, according to the production division of the American Motorists' Association.

CANADA

Footwear Sales Situation

Colonel A. E. Massie, Maritime Province Manager of the Dominion Rubber Co., Ltd., with headquarters at St. John, N. B., reviewing the rubber footwear situation both present and prospective is quoted as saying: "A very substantial price reduction has been made and the trade will be privileged to take advantage of some reductions from February 18. Canadian manufacturers have adopted lower prices which should not be a hardship to dealers as stocks are well reduced, and if consideration is given the consumer, a clean-up should be made during the next six weeks, thus permitting the purchase of new goods at reasonable prices for next fall delivery."

The new samples show many innovations and new creations for ladies' wear. The Gaytee and fancy overboot have reached the millinery problem and the new colors and fabrics are most serviceable and smart. Rubber carriage boots have been wonderful sellers during the past season.

T. Y. O'Neill, sales manager of the Miner Rubber Co., Ltd., Granby, Que., sums up the rubber footwear business as follows: "Footwear trade has been poor this winter in all parts of Canada, because the weather conditions curtailed the usual demand for rubber footwear. There is this comforting feature, however, and that is the people generally have not been buying new rubber footwear; so there will be quite a heavy demand just as soon as the weather breaks next fall."

Mr. O'Neill is at present in the Maritime Provinces, visiting St. John, N. B., Halifax, N. S., and other prominent centers.

N. E. Davidson, recently appointed manager of the North British Rubber Co., Ltd., Toronto, Ont., was a recent visitor to the fourth annual International Golf Show and Country Club Equipment Exposition held in New York, N. Y.

R. W. Ashcroft, a well-known rubber executive and now manager of the Trans-Canada Broadcasting Co., Toronto, visited Montreal last month and addressed members of the Advertising Club of Montreal.

H. W. Blahout, Dunlop Tire & Rubber Goods Co., Ltd., Toronto, Ont., was recently elected treasurer of the Canadian Industrial Traffic League.

British Industries Fair. Gutta Percha & Rubber, Ltd., Toronto, Ont., and The Seiberling Tire & Rubber Co., (of England) Ltd., were exhibitors in the Canadian section of the British Industries Fair that was held at White City, England.

W. R. Burgess, Vancouver, B. C., and Canadian representative of the New York Rubber Corp., is touring the Dominion in the interests of the manufacturers he represents.

D. E. Rogerson, Dunlop Tire & Rubber Goods Co., Ltd., Toronto, Ont., presided at the banquet of the Canadian Bicycle Dealers Association held recently at the Royal Connaught Hotel, Hamilton, Ont.

Eastern Rubber Co., Ltd., Acton Vale, Que., is planning an addition to its factory which will be of brick, two stories, 40 by 50 feet, and cost approximately $6,000.

J. R. Dunlop has been recently appointed manager of the Winnipeg, Manitoba, branch of the Independent Rubber Co., Ltd.

Gutta Percha & Rubber, Ltd. Satins are prominent in this firm's new footwear styles and spat rubbers are a feature on which special sales efforts are being made.

Firestone Tire & Rubber Co. of Canada, Ltd., recently entertained 200 dealers from all parts of the Toronto district at a get-together meeting in the Prince George Hotel, Toronto, Ont. S. S. Du Moulin, treasurer of the company, detailed the career of Mr. Firestone and gave an outline of the development of the business. J. A. Livingston, sales manager of the Hamilton branch, spoke on merchandising and outlined ideas for promoting trade with tire dealers.

F. Longdon & Co., (Canada) Ltd., 145 Wellington St., West Toronto, Ont., manufacturer of elastic sport goods, announces lower prices owing to increased production facilities. F. Longdon & Co., the parent concern, is said to be the largest plant in the world manufacturing elastic hosiery and kindred lines.

Dunlop Tire & Rubber Goods Co., Ltd., Toronto, Ont., announces the re-election, at a meeting of the directors, of the following officers: president, Hon. E. B. Ryckman; vice-president and general manager, J. Westren; and secretary-treasurer, A. E. King. The directors are: Hon. E. B. Ryckman, Toronto; Wm. Coyne, Wilmington, Del.; E. B. Germain, Buffalo; A. B. Purvis, Montreal; Wm. McMaster, Montreal; G. H. Eaton, London, Eng.; J. Westren, Toronto; D. E. Beynon, Toronto; and A. E. King, Toronto.

General Rubber Goods Co., Ltd., Galt, Ont., is said to be doing exceptionally well in the manufacture of sheet rubber goods and sundries. It has developed a new material for automobile topping.

Goodyear Tire & Rubber Co., of Canada, Ltd. When the shipping staff concluded work on a recent Saturday, approximately 65,000 tires were checked, packed, and shipped to either the export or domestic trade. This is close to an average daily shipment of 11,000 tires. The largest day's shipment was over 16,000 tires. When it is considered that an almost corresponding number of tubes went with these shipments, it makes well over 100,000 tires and tubes shipped in one week.

Dominion Rubber Co., Ltd., announces Blue Bar quality in its heavy rubber footwear. This is not a trade mark nor is it a new line, but it identifies the best quality of heavy rubber footwear with a particularly strong appeal to lumbermen, fishermen, farmers, laborers, and workmen in general.

Canadian Goodrich Co., Ltd., will erect a four-story addition to its factory at Kitchener, Ont., costing about $100,000. This is the second addition within a year.

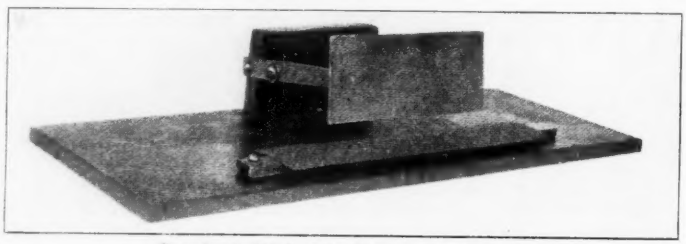
Testing Dielectric Strength of Fabrics

THE remark is frequently heard to the effect that a law is not of much use unless it is enforced. The same comment might properly be applied to the question of specifications for carrying on certain tests and the equipment necessary to make the tests.

The national engineering associations and in particular the American Society for Testing Materials prepare very detailed specifications as to how certain tests shall be made after giving exact dimensions of parts to be used and their relations to each other, but the actual equipment must sometimes be obtained by individuals in the best way possible.

The illustration shows a little piece of equipment recently constructed in the Laboratories' shops for testing the dielectric strength of insulating tape, varnished cloth, and similar sheet fabrics under the standard specifications adopted by the American Society for Testing Materials.

The base and hinge support are made of insulating material. On the base is placed a bar of metal ½-inch in width over which the material to be tested is laid.



Standard Dielectric Tester for Fabrics

The upper electrode consists of a hinged copper plate 5 inches long with a rounded lower edge. This plate is also of required size as to width and thickness.—B. H. Glover in *Laboratories' Data*, Feb. 1929.

The Rubber Industry in Europe

GREAT BRITAIN

British Industries Fairs

The 1929 British Industries Fairs, held at London and Birmingham, have elicited praise on all sides for the comprehensiveness and attractiveness of the exhibits. A large number of British firms was represented, and not a single article displayed was of wholly foreign manufacture. Speaking of the London section, it may be said that, while almost every type of rubber goods was on display except tires, sporting accessories for tennis, golf, bathing, etc., rubber novelties and upholsteries predominated, the footwear lines being particularly complete.

More or less full lines of footwear were shown by the Canadian section of the Gutta-Percha & Rubber (London) Co., Ltd.; J. G. Ingram & Son, Ltd.; Jell & Marlow, the Palatine branch of the Leyland & Birmingham Rubber Co., Ltd.; The North British Rubber Co., Ltd.; the Rubber Growers' Association; and the Vitalite Shoe & Sock Co., Ltd.

Special mention should be made of the dainty colored beach and bathroom slippers of J. G. Ingram & Son, Ltd., and of the colored canvas shoes in original designs shown by the Palatine Branch of the Leyland & Birmingham Rubber Co., Ltd. These shoes can be fitted with rubber soles in colors to match.

Very attractive sponge rubber bathroom mats were exhibited by The Avon India Rubber Co., Ltd., each mat being sealed in a large envelope to insure clean delivery.

Handsome silver-surfaced, rubber-backed toilet articles—brushes, mirrors, clocks, photo frames, etc., were featured by the British Metallising Co., which employs a special process for depositing silver on a hard rubber base. See illustrated description on page 60.

The Dunlop Sports Co., distributer of Dunlop sports goods, showed an electrically driven machine which tests racket frames, gut, and tennis balls in the same operation.

Onazote refrigerators insulated with expanded rubber, Onazote hospital sheeting, underfelt, floats, and golf practice balls, besides a variety of molded articles, all of expanded rubber, made the stand of the Expanded Rubber Co., Ltd., particularly interesting.

As usual the Reliance Rubberware, Ltd., succeeded in attracting attention by the beautiful color effects and fine finish of its goods. Besides the artistic bathing caps and seamless molded sponge bags made to match the caps, there were on view fitted toilet cases in waterproof covers, first aid pocket wallets, a new proofed fabric resembling suede and named "suedine," used for tennis racket covers, air pillows, and unsinkable sports cushions, and, finally, a handsome tea-tray of highly finished ebony black, hard rubber decorated in striking jazz colors.

Rubber Brushes, Ltd., produces a thread rubber type of brush known as the Ruba brush. There is a Ruba brush for suede coats, for spats and fancy shoes, for decorators to use in stippling, for grooming horses, for the artificial silk trade, etc.

Rubber Roadways

A further conference on rubber roadways was held January 30, 1929, at the Midland Hotel, Manchester, Eng., under the joint auspices of the Rubber Growers' Association and the Institute of the Rubber Industry. Sir Stanley Bois again presided. On this occasion the present size of rubber blocks was criticized and the suggestion offered that two-foot blocks be used, whereby, among other advantages, the tendency of the blocks to creep would be lessened.

Col. Chapman thought that the size of the blocks might advantageously be increased up to economical proportions. In some respects, the bigger the block, the better it was. He pointed out that the Cowper block, which is not a composite block, was originally 9 by 4½ inches, but the size had been doubled and the results were most satisfactory. The difficulty with the Gaisman block is that it is quite heavy and if the brick base were bigger it would be hard to dry true to shape.

In answer to questions regarding the slipperiness of rubber on a rubber surface, Col. Chapman showed that this was far less than with other types of paving, and as to the effects of direct sunshine on the blocks, he reminded his hearers that blocks taken from a section of rubber paving in Singapore that had borne a good deal of traffic in addition to being exposed to the tropical sun during these years were perfectly sound and good.

The real difficulty about paving with rubber is the cost. Mr. Gaisman offered an interesting solution of this difficulty which Sir Stanley Bois said would be very carefully considered by his committee and directors.

Mr. Gaisman stated that concerns fronting streets paved with rubber benefited to such an extent that they should be willing to help introduce this kind of paving, and as a matter of fact two different important firms had actually offered to contribute £2 per square yard toward the cost of paving with rubber a certain area of the street on which they fronted. However, since the cost of rubber paving was £4 per square yard, there would still be a balance of £2 to be made good.

His suggestion, therefore, was that frontagers be asked to contribute not £2, but £1 10 shillings per square yard, the local authority to pay 10 shillings, and that instead of the balance of £2, the contractor should collect a rental of 5 shillings 2 pence per annum, this 5 shillings 2 pence being arrived at as follows: the uncollected £2 would be divided into ten annual installments of 4 shillings to which would be added the interest on the money outstanding. This would at the same time be a guarantee to the local authority that the pavement would be satisfactory for ten years. The manufacturer would have to wait ten years before he got all his money, but if the paving were in good condition after the ten years his prosperity was assured because of the further years of rent he would be able to collect.

Production and Consumption Estimates for 1929

The *Financial Times* has compiled the following table showing the estimates of production and consumption of crude rubber for the current year.

	Estimated Production	Estimated Consumption
Symington & Sinclair....	726,000	723,000
Lewis & Peat.....	690,000	699,000
Hymans Kraay & Co.....	715,500	692,000
Wm. Jas. and Hy. Thompson	707,000	705,000
Geo. White & Co.....	732,000	710,500
Rickinson	727,000	727,000
Eric Miller	700,000	700,000
E. A. Barbour, Singapore..	725,000	684,000
Lane Mitchell	695,000	720,000

It is interesting to note that of the nine estimates quoted, five suggest the expectation that consumption will be under production. Furthermore, there is a difference of 42,000 tons between the highest and lowest estimates of production and a difference of 43,000 tons between the highest and lowest estimates of consumption for the current year. Eric Miller's estimates should be amplified by the remark that the estimated production should be put below 700,000 tons, and the consumption above that figure.

Liberian Rubber in the House of Commons

In the House of Commons recently Sir Hamar Greenwood asked the Foreign Secretary if the government's attention had been drawn to the action of the Government of Liberia in expropriating the property and the rights of the Liberian Rubber Corp. in Liberia without legal action in Liberia or elsewhere, thus depriving English creditors and shareholders of the value of a rubber estate upon which £100,-

000 had been spent in development; and what action the government proposed to take with a view to obtaining redress.

Sir Austen Chamberlain, in a written reply, said His Majesty's Government had devoted careful consideration to the matter. The Liberian Government maintains that the creditors of the corporation had a remedy open to them in the Liberian courts. Inquiries had been made of the creditors as to whether the latter desired to seek this remedy in the courts, with His Majesty's Government watching the proceedings, or whether they would prefer that His Majesty's Government should invite the Liberian Government to submit the merits of the whole case to arbitration. The creditors had not yet communicated their decision in the matter.

Referring to the above, the properties in question, of course, are now being occupied by the Firestone Plantations Co.

GERMANY

Rubber Statistics

Germany's consumption of crude rubber during 1928 showed a slight decrease as compared with the year before. Total arrivals of crude rubber into the country came to 423,908 quintals against 425,638 quintals, but during 1928 reexports were 39,380 quintals against 30,484 quintals in 1927, so that the net 1928 figures were reduced to 384,628 as compared with the 395,154 quintals for the preceding year. The difference in the values, as a result of the drop in the crude rubber market, is more marked, the total 1928 figure having been 108,143,000 marks, instead of 167,126,000 marks.

The export of rubber manufactures seems to have undergone a slight change for the better, the totals for the year under review having amounted to 189,696 quintals, value 115,287,000 marks, compared with 167,037 quintals, value 102,917,000 marks. Slight increases in the export figures of all lines are to be noted except in the case of tubes for motor vehicles and tires for vehicles other than motor vehicles, and in some lines of partly finished hard rubber goods, for which items small decreases are shown. The amounts for some of the leading articles follow: tubes for motor vehicles, 166,465 compared with 174,532; tubes for other vehicles, bicycles, etc., 2,782,396 against 2,641,713; automobile tires, 180,193 compared with 154,055; bicycle tires, 945,860 against 884,268; belting, hose, and packing, 25,184 instead of 23,812 quintals; footwear, 2,686 quintals instead of 2,539 quintals; articles of rubber combined with fabric, 19,796 compared with 17,109; soft rubber goods not elsewhere specified, including floor coverings, rubber sheets combined with fabric, iron rolls with rubber, 64,010 against 57,515 quintals.

The total values for imports of rubber manufactures continues to increase slowly, and for 1928 were 67,959 quintals, value 38,328,000 marks, compared with 62,681 quintals value 38,330,000 marks. The chief increases were noted in rubber thread, 2,766 quintals against 2,348 quintals; tubes for bicycles and other non-motor vehicles, 266,752 compared with 121,422; belting of rubber and fabric, 1,264 quintals against 928 quintals; footwear, 752 quintals compared with 631 quintals; bicycle tires 465,312 against 349,523; other soft rubber goods not elsewhere mentioned, 6,316 quintals compared with 4,017 quintals. America was chiefly responsible for the increased imports of the latter type of goods, totals from this country having amounted to 4,265 quintals as compared with 2,017 quintals.

America also supplied more than half the footwear imports and an equal proportion of the imports of hose. Belgium and France continue to be the main sources for bicycle tires and tubes, although it seems that Belgium is losing heavily to France; for instance, Belgium shipments of bicycle tires dropped from 270,217 in 1927 to 175,749 quintals in 1928. Imports of automobile tires and tubes fell during the year, the tube shipments having been 197,713 against 218,724, and those for tires 316,626, against 352,293. While the Belgian imports of tubes showed the heaviest decrease (from 76,188 to 59,812), the decrease in tire arrivals may be chiefly ascribed to the falling off of business with America in these goods, the comparative figures for this country having been 148,421 in 1928 and 181,868 in 1927, although it continues to be Germany's main source of foreign tires.

New Raincoats

Raincoats for women are becoming more stylish and colorful. Latest showings of spring and summer models indicate that plaids, large and small checks, besides plain colors in high and pastel shades will be in vogue. The better type of coat for the warmer weather continues to be of silk, satin, taffeta and crepe-de-chine, some cleverly and intricately modeled for afternoon wear, and others in the snappy trenchcoat style for sports and travel. Stitched panels, pleats and intricate seaming are features of the dressier type of coats.

One model of rubberized red crepe-de-chine had strips applied down the length of the back, and this trimming was repeated on the pockets and the sleeves, while wide revers and collar added final distinctive touches. Similar models were shown in which the facings were of white on a jade green crepe-de-chine coat, and royal blue on a white coat. Plaid taffeta coats, with inset or raglan sleeves show a more mannish cut. A special favorite seems to be a pastel colored silk coat with pure wool lining of plaid in a small design. Here the plaid faces the revers, and is applied in jaunty triangles, held down by a button, to form cuffs and pockets.

A particularly well-made model of Duchesse showed a novelty yoke in the back from which fell wide pleats held together by the belt which appeared to be cut in one with the side panels, and was decorated front and back with a mother-of-pearl buckle. Hats to go with these attractive coats are made of matching materials in variations of the cloche and turban models.

The favorite materials for men's raincoats are rubberized English type fabrics, for sport and travel and trench-coats of gabardine, preferably in dark blue. For these coats, raglan sleeves, wide belts and large patch pockets are preferred.

German Notes

The I. G. Farbenindustrie has just put on the market an anti-freeze compound for radiators known as "Glysantin," which is an ethylene-glycol preparation and is said to give even better results than glycerine or ethylene-glycol, particularly in the way it affects the radiator hose. Solutions of the new preparation are said to react even more favorably on the hose than hot water which in the course of time diminishes the strength and elasticity of rubber. Glysantin helps to prolong the life of rubber so that the danger of the rubber packing in the radiator loosening is greatly diminished. This new compound is said to have a favorable effect on other types of packing as well.

Continental Caoutchouc und-Guttapercha Compagnie recently announced that a block of shares, which had been owned by The B. F. Goodrich Co., Akron, Ohio, since 1920, had been bought back from the American firm by a group led by the Danat Bank, under agreement with the Continental concern. This move seems to be connected with new fusion plans in the German tire industry, and according to latest reports negotiations, which had been started some little while ago without leading to any apparently definite result, have been taken up again and will be energetically pushed. The fact that the Peters Union firm has again postponed its business meeting for discussing the balance sheet, is said to bear out these reports.

Max Muller, Maschinen-und Formenfabrik, Hannover-Hainholz, celebrated the fortieth year of its existence on January 2, 1929. This firm which started on a small scale has now become one of the best-known factories for machinery and molds for the rubber industry and supplies not only German factories but almost every rubber manufacturing country outside of Germany.

Smuggling on the eastern and western borders of Germany has been rather frequent of late. On the eastern border the complaint comes from Poland that German goods are being smuggled into Polish territory. On the western border, Holland and Belgium are involved and it seems that here, in spite of all the vigilance of the customs and border authorities large quantities of rubber goods, chiefly surgical, seamless goods and toys change hands without having previously passed through the customs offices. To discourage such activities it is suggested that the smuggled goods should be destroyed by the authorities to prevent resale at low prices. Accomplices of the smugglers are among the chief purchasers.

Lower German Rubber Duties

Among the articles on which lower tariff duties may be charged in Germany, according to a pending bill, are rubber hose, rubber-coated carriage or automobile textile covering, and fine rubber tubing.

The Rubber Industry in the Far East

MALAYA

Optimism Justified

Last month there was a tendency toward optimism among most of the rubber producers, and this optimistic feeling has been amply justified by the events of the last month or so. Rubber started to go up and has fortunately continued slowly to move to a figure at which most producers can operate with easier feelings about the profit margin. While, of course, there are those who are jubilantly looking forward to another boom, others made wise by experience are regarding matters without undue elation. In fact, there is a tendency toward reserve to be noted in many cases. Local business men feel that the rise is not wholly warranted by the actual position, and is largely due to speculators who expected an avalanche of rubber after November, 1928, and were consequently caught short.

Others ascribe the upward trend to the fact that a survey of the position at the end of 1928 by American importers and manufacturers disclosed that rubber had not come on the market in such quantities as it was confidently expected would be the case after restriction had been removed, and therefore buyers in a panic have hastily started to stock up.

The truth is that bona-fide buyers and speculators were a good deal misled by the restriction statistics, which gave rise to predictions of world output that have fallen far short of actual figures.

Realizing that part of the misunderstanding of the productive capacity of the rubber producing centers was caused by the clamor of producers over what they called under-assessments during the restriction period, Asiatics lay the blame at the door of the large European estates, and Europeans point at the Asiatics, particularly at the small holder. The Asiatics say that many estates that were assessed at 700 pounds per acre and over are unable to produce this amount now that restriction has been removed and consequently the large quantities of rubber that were looked for have failed to materialize. It is expected that the advent of the dry season will still further diminish outputs from the European estates.

The Asiatic can safely assume a holier-than-thou attitude toward the European in this respect, for, while the latter obtained permission to export what amounted to near full production, he cannot now give proof that he restricted by showing an increase in outputs with free rubber; the former, having smuggled rubber out of the country that could not be exported legally under restriction, now points with pride to his harvests so much higher than they were during the restriction period. When one comes to think of it, restriction, in practice, was rather a pretty farce!

But to return to the market trend and its effect here. It is reported that producers are showing a certain amount of reserve and are not so readily entering into forward contracts. What heartburning there must be among shareholders who know that their directors have sold forward what in some cases forms a very large part of the total output at prices around 9½ pence per pound! Another result of the rise in prices is the renewed interest that is being taken in remilled rubber. Demand for this article had naturally fallen off considerably, but now it seems to be quite active again.

Rubber Stocks in Malaya

Official figures give the results of the census of rubber at the end of January, 1929, as follows:

The estimated dry weight of rubber of all grades on estates of over 100 acres: Federated Malaya States, 18,956 tons; Straits Settlements, excluding Singapore and Penang, 3,329 tons; and Johore, 6,224 tons; or in all 28,509 tons. The stocks of prepared rubber ready for sale on the same estates were: Federated Malay States, 13,968 tons, and Straits Settlements, excluding Singapore and Penang, 2,584 tons, totaling 16,552 tons. (Figures for Johore were not available.) Stocks held by dealers were: Federated Malay States, 10,652 tons; Straits Settlements, excluding Singapore and Penang, 2,091 tons; Johore, 2,140 tons; besides dealers' stocks in Singapore and Penang at the same date amounting to 29,617 tons; making total stocks in hands of dealers, 44,500 tons.

As far as the Straits Settlements are concerned, the dealers' stocks upon analysis were found to comprise 11,721 tons of smoked sheet, 3,348 tons of unsmoked sheet, 13,307 tons of crepe, 1,603 tons of scrap, and 1,929 tons of lump.

Stocks of partly manufactured rubber are not included in the figures of prepared rubber ready for sale.

CEYLON

H. Stuart Hotchkiss Discusses Planting Progress

That 1929 would prove to be one of the biggest years the rubber industry had ever seen was the opinion expressed by Colonel H. Stuart Hotchkiss, president of the General Rubber Co., in the course of an interview published in the *Ceylon Observer* recently. Colonel Hotchkiss, who has just visited Holland and England in connection with the affairs of the company, is on a tour of inspection of the estates of the concern in the East.

When asked what were his reasons for his optimism, he declared that this was due to the prosperity in the United States and the increasing consumption in the rest of the world.

Regarding planting matters, the Colonel is quoted as saying:

"So far as our own company is concerned, we are going ahead with our program of plantation development. We have now just under 100,000 acres under cultivation—some 63,000 acres in Sumatra and over 30,000 acres in Malaya—and we are concentrating upon the economic development of these plantations."

He added that his company was fully convinced of the importance of scientific methods and, to illustrate how well science pays in rubber cultivation, stated that in a district where the average yield of other estates was 300 to 350 pounds per acre, an average yield of 550 pounds per acre had been obtained by his company from one block of 43,000 acres, and this was entirely due to soil conservation and manuring, without the benefit of bud grafting.

1000 Pounds Per Acre

With regard to bud grafting, Colonel Hotchkiss informed his interviewer that the company had great faith in the method and had at the moment over 30,000 acres of partially budded rubber or of estates planted with seed selected under modern and approved methods of selection. From the results obtained from experimental areas already in bearing, he was convinced that 1,000 pounds per acre would be obtained on the latest plantings. These high-yielding strains are now being introduced on the company's estates in Malaya. To those who are constantly pointing to Brazil, the original source of the Hevea, as the place *par excellence* from which seed should be obtained if high yields are expected, the Colonel's reply to a question in this regard should give food for thought.

He said that the General Rubber Co., which did not spare any expense where scientific work was concerned, had gone fully into the matter and had come to the conclusion that it was one of the directions in which it would not be profitable to spend money. He personally had visited the Amazon and had found that the yields from trees, even in the basin of those tributaries of the river where the so-called black variety predominated, varied enormously and much in the same way as they

did on the older estates in the East, so that he felt that it was more profitable to concentrate upon breeding from the tested mother trees which the East already possessed.

Regarding Price

Colonel Hotchkiss is of opinion that 1 shilling 3 pence per pound is a fair economic price for rubber today, and that there is danger to the industry if the price goes above that figure. At the same time he finds it absolutely necessary that rubber producers should concentrate upon increasing yields and reducing costs to a point where they can produce with profit even if the price drops to 8 pence per pound. This is necessary, he thinks, because of the competition from native rubber which it will only be possible to check if a sufficient number of European estates have sufficiently high yields to be able to produce profitably at the low figure given.

Henry C. Pearson's Ceylon Visit in 1904

Because of its historical interest, the *Tropical Agriculturist* of January, 1929, publishes impressions of the rubber industry in Ceylon as submitted by the Editor of the INDIA RUBBER WORLD, then visiting the East, and printed by the *Times of Ceylon* in its issue of August 2, 1904. The extract in question was supplied to the *Tropical Agriculturist* by D. Davidson of Culloden Estate, which estate happens to be one of those visited by Mr. Pearson in 1904, and certain portions are quoted below as having a special appeal at the present time.

After descriptions of the land on which rubber was planted on Culloden and the tapping methods employed there, comes this:

"While I was there a very interesting experiment in scraping the outer bark from the trees had just been finished. The results, as far as could be determined, were such a stimulation to the lactiferous ducts that the flow was increased nearly 50 per cent. The oldest trees on this plantation, by the way, are 18 years, and have produced 3 pounds a year; by scraping the outer bark off, they expect to get 6 pounds a year from each of these. There are only a few of these older trees, however, most of them being 7 or 8 years of age."

Oil from Hevea Nuts

That experiments with oil from Hevea seed are not so new is seen from the following:

"As a better preparation, however, against the time when the seed will be a drug in the market, my host was experimenting with an oil made from the seeds. With a crude native mill he turned out an oil which the native women eagerly purchased to burn before their gods, while the pressed cake made an excellent food for cattle."

Coarse Rubber

Rubber prices being what they are at present the remarks on "coarse rubber" are rather inviting:

"There is also a coarse rubber that is secured by picking the scrap from tapped trees. It is a very excellent rubber, and while I was there it found a market at 3 shillings 5½ pence while the fine was bringing 4 shillings 9½ pence."

Rubber Strips

A description of the method of coagulating and preparing for market was followed by this comment:

"The time will come, however, when the coagulating and drying will have to be done on a different plan. The present method takes up too much room and is too slow. It would be perfectly easy to have coagulating pans that would deliver strips of rubber 10 feet long, a foot wide, and a quarter of an inch thick. These strips could then be run through rolls that would squeeze out the excess water, and, at the same time, imprint the plantation name every few inches. Then the strips could be hung up to dry and any degree of artificial heat applied that was thought best.

"There have been suggested also a variety of quick coagulating devices such as endless belts that take a film of milk into a drying chamber and deliver it to the other side coagulated and dried. Some such plan may prevail, but, as yet, the planters are not ready for it."

Costs in Ceylon and Brazil

Space limitations forbid quoting much more from this interesting article, but one more extract must follow:

"The rubber landed in Colombo costs 16 cents a pound, United States money. Just to let the skeptical do a little bit of thinking, and by the skeptical, I mean the majority of rubber manufacturers who believe that the Para from the Amazon is a better business proposition—just to start them thinking, therefore, I want to ask them to read the following:

Fine Para Rubber from Ceylon		
Sells at Liverpool, per pound		$1.20
Cost, f. o. b., Liverpool	$0.17	
Export duty	nil	
		.17
Planters' profit		$1.03
Fine Para Rubber from Brazil		
Sells at Liverpool, per pound		$1.00
Cost, f. o. b., Liverpool, minimum	$0.21	
Export duty	.23	
		.44
Profit		$0.56

"The above figures both for Ceylon and South America are very small—that is, the cost figures. It is probable that 20 cents a pound for cost in Ceylon would be nearer actual practice, while Para rubber costs landed in Para or Manaos often 40, 50 and 60 cents a pound, the figures being dependent upon the section that it comes from."

Record of Yield

"At the present time he (Mr. Harrison of Culloden) keeps a careful record of the production of each tree, and for this purpose the trees are numbered. When a tree has a circumference of 30 inches it is fit to tap, whether it is 5, 6, 7, or more years old. His first year's tapping in 1901 was 4,010 trees, from which he secured 4,600 pounds of first quality Para. In 1902 the production was about the same; the production for 1903 from 8,300 trees being 10,500 pounds. From 2,500 trees on Heatherly, which has just come in bearing, he gets 3,500 pounds."

One wonders how long the system of recording yields on this estate was continued. At the present time such a record should prove valuable for more than one reason.

NETHERLANDS EAST INDIES

Budded Stock for Liberia

Some time ago, *De Planter* reported that an assistant from the East Coast of Sumatra had gone to Liberia, taking along with him 20,000 budded plants for the rubber plantings on the Firestone Estates in Africa. The *Sumatra Post* now announces that it has learned from a report from the young man in question that 50 to 55 per cent of the plants had arrived in good condition, which may be considered a high percentage considering the changes in temperature that the young plants had to undergo. Thus it was 97° in Belawan, Sumatra, 60° in Barcelona, and even 55° and less at Capablanca. At the latter place it was thought that all the plants would die, but fortunately more than half survived the ordeal and it now remains to be seen how they thrive in their new fatherland.

New Agriculture Chief

Dr. Ch. J. Bernard has been nominated Director of the Department of Agriculture, Industry, and Commerce of the Netherlands East Indies, succeeding Dr. Rutgers, who is now governor of Surinam.

Dr. Bernard is a Swiss by birth and before being nominated had to become a Dutch citizen. He came to the Dutch East Indies in 1905, and although he has devoted himself chiefly to tea, he is by no means one-sided. On the contrary, he has always shown the greatest interest in everything that concerned the development of the colonies. The appointment is, therefore, all the more welcomed, as in Dr. Bernard the Department now will again have a man who couples with scientific achievements an eminently practical outlook, a man who knows his Netherlands East Indies, both as concerns the country and the people.

Dutch Rubber Output in 1928

The first official Netherlands estimate on total dry rubber exports from the Dutch East Indies for 1928, according to United States Commerce Reports, gives the total shipments as 224,000 tons (metric), equal to 224,464 long tons.

ALTHOUGH BRITISH AND GERMAN druggists' rubber sundries lead in sales in British India, the United States supplied such goods to the value of $117,968 during eleven months in 1928, as compared with $111,168 in all 1927 and $107,733 in 1926. American water bottles, surgeons' gloves, inflatable toys, composition belts for men, and especially toy balloons, led all other foreign sales of such goods.

Rubber Patents, Trade Marks and Designs

Machinery Patents

United States

1,701,832.* MASTICATOR. This machine departs from the usual types of rubber masticators in that it employs two sets of concentric mixing blades between which the rubber is kneaded and rubbed, and by the action of which the compounding of the rubber is effected.—Park E. Welton, Akron, O.

1,702,088.* TIRE MAKING MACHINE. An important object of this invention is a guide shoe of simple construction capable of (1) guiding the carcass material with minimum friction and (2) flexing transversely to deliver the material to the revolving building core without distorting the fabric.—H. I. Morris, assignor to The Cord Tire Machine Co., both of Cleveland, O.

1,702,112.* TIRE FORMING DEVICE. This is of especial value in mounting tires shaped from "flat" bands on the bead-clamping rings upon which they are vulcanized.—John R. Gammeter, Akron, O., assignor to The B. F. Goodrich Co., New York, N. Y.

1,702,123.* CHANNEL RUBBER MACHINE. By this assembly of apparatus two strips of channel rubber are extruded in adjacent positions and shrunk by passage through cold water. They next pass through a covering machine to receive felt covering and are delivered so as to bring the two strips into association with one leg of each strip extending into the channel of the other for mutual support. While thus associated the strips are cut to length and cured in open heat.—G. L. Matthias, Cuyahoga Falls, O., assignor to The B. F. Goodrich Co., New York, N. Y.

1,703,829.* MOLD CONVEYER. This provides a conveyer synchronized in its operations so that the devices on the upper conveyer for carrying the mold sections will always be in such relative position to the mold engaging devices on the lower conveyer that the molds will be separated vertically.—M. H. Pade, assignor to The Firestone Tire & Rubber Co., both of Akron, O.

1,703,832.* TIRE FINISHING MACHINE. The chief object of this invention is to provide a universally mounted core-carrying chuck and tire-shaping devices operable onto the core in various positions of the chuck.—W. C. Stevens, assignor to The Firestone Tire & Rubber Co., both of Akron, O.

1,703,918.* AIRBAG ASSEMBLING MACHINE. This is an apparatus adapted to spread the beads of a tire casing while presenting the airbag for insertion within the casing without injury to the bag.—A. O. Abbott, Jr., assignor to Morgan & Wright, both of Detroit, Mich.

1,703,919.* AIRBAG FOLDER. This provides a machine by which an airbag may be temporarily shaped for insertion into the cavity of the tire with comparative ease, thereby relieving the workman of this task.—A. O. Abbott, Jr., assignor to Morgan & Wright, both of Detroit, Mich.

1,704,440.* COLLAPSIBLE HOLDING DEVICE. This contractible supporting and holding device for airbag formers comprises means to position the sections so that the airbags can be put on and taken off the holding device without shifting any of the holding sections out of the plane of operative continuity.—T. P. Little, assignor to The Fisk Rubber Co., both of Chicopee Falls, Mass.

1,702,113. TIRE TRIMMING DEVICE. O. S. McChesney, Kenmore, assignor to Dunlop Tire & Rubber Corp., Buffalo, both in N. Y.

1,702,113. TIRE TRIMMING DEVICE. O. Gandee, Akron, O., assignor to The B. F. Goodrich Co., New York, N. Y.

1,703,970. RETREADING MOLD. K. K. A. Thorsen, San Francisco, Calif.

1,704,002. RESTRAINING TIRE REBOUND. B. B. Holmes, New York, N. Y.

1,704,291 to 1,704,294 Inclusive. COLLAPSIBLE CORES. All granted to O. J. Kuhlke, assignor to The Kuhlke Machine Co., both of Akron, O.

1,704,528. SHEET APPARATUS. V. H. Bodle, Akron, O., assignor to The B. F. Goodrich Co., New York, N. Y.

*Pictured in group illustration.

Dominion of Canada

287,008. VULCANIZING APPARATUS. The Dominion Rubber Co., Ltd., Montreal, Que., assignee of A. Otto, Detroit, Mich., U. S. A.

287,200. MOLD. The Goodyear Tire & Rubber Co., assignee of W. H. Campbell, both of Akron, O., U. S. A.

287,202. BAND MAKING MACHINE. The Goodyear Tire & Rubber Co., assignee of E. F. Mass and E. G. Templeton, all of Akron, O., U. S. A.

287,203. COLLAPSIBLE CHUCK. The Goodyear Tire & Rubber Co., assignee of E. G. Templeton, both of Akron, O., U. S. A.

287,204. INSERTING AIRBAGS IN TIRES. The Goodyear Tire & Rubber Co., assignee of R. W. Snyder, both of Akron, O., U. S. A.

287,205. BAND MAKING APPARATUS. The Goodyear Tire & Rubber Co., Akron, O., assignee of D. S. Harrington, Atlanta, Ga., both in the U. S. A.

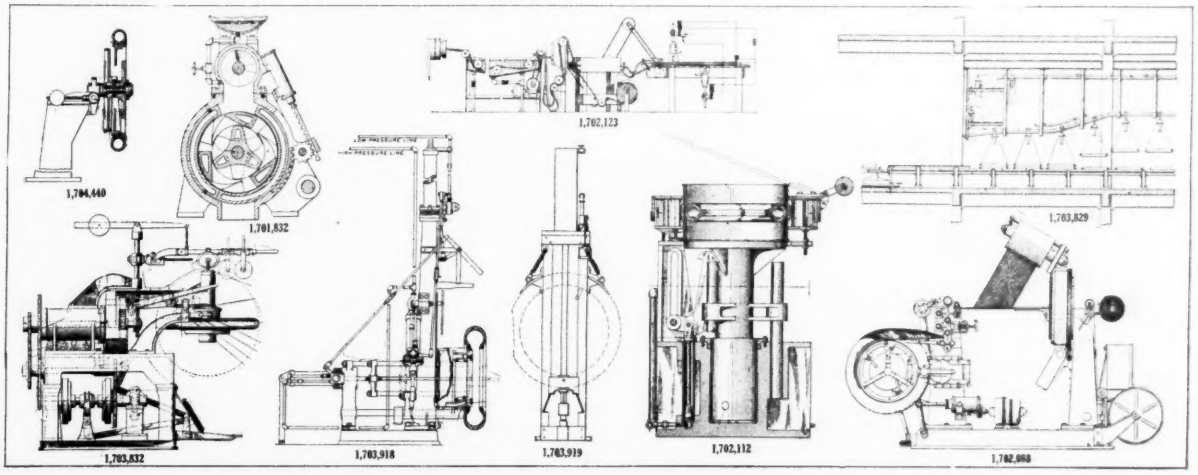
287,206. EXTRUDING MACHINE HEAD. The Goodyear Tire & Rubber Co., Akron, O., assignee of L. Wetmore, Alameda, Calif., both in the U. S. A.

United Kingdom

301,802† TREATING MOLDS. A. Voshage, 6 Haasemannstrasse, Hanover, Germany.

302,096. PERFORATING NIPPLES. E. A. Young, Wadsworth, O., U. S. A.

† Not yet accepted.



Rubber Patents, Trade Marks and Designs

302,182.† TIRE TUBES. Rubber Latex Research Corp., assignee of W. B. Wescott, both of 80 Federal St., Boston, Mass., U. S. A.

302,343† SHAPING TIRES. Goodyear Tire & Rubber Co., 1144 E. Market St., assignee of R. W. Snyder, 1015 Amelia Ave., both of Akron, O., U. S. A.

302,491. REPAIR VULCANIZER. B. Griffith, 31 Cromer Dr., Wallasey, Cheshire, and T. M. Wightwick, 47 Regent Rd., Liverpool.

302,787. PRESSURE RESISTING COVER. D. Bridge & Co., Ltd., Castleton Iron Wks., Castleton, Lancashire and E. Bradshaw, 50 Bosworth St., Rochdale.

302,876. VULCANIZING CORE. N. S. Dodge, Park Ave., Emeryville, Calif., U. S. A.

302,958. COATING MACHINE. British United Shoe Machinery Co., Ltd., Union Wks., Belgrave Rd., Leicester.—(United Shoe Machinery Corp., 205 Lincoln St., Boston, Mass., U. S. A.)

302,975. VULCANIZING MOLD. C. Macbeth, 67 Norwich Union Chambers, Congreve St., Birmingham.

302,995†. APPLYING TREADS. Goodyear Tire & Rubber Co., 1144 E. Market St., assignee of H. T. Kraft, 267 Storer Ave., both of Akron, O., U. S. A.

303,075. MOLDING AND VULCANIZING. Dunlop Rubber Co., Ltd., 32 Osnaburgh St., London, H. Willshaw, W. A. Davis and H. Smith, Fort Dunlop, Birmingham.

303,214. ELECTRODEPOSITION OF RUBBER. S. O. Cowper-Coles, Rossall House, Thames St., Sunbury-on-Thames.

Germany

471,834. VULCANIZING SHEETS. Hydraulik G. m. b. H., Duisburg.

472,017. MILKING CUP RUBBER. Ramesohl & Schmidt, A. g., Oelde i. W.

472,231. HARD RUBBER BATTERY BOX. Adolf Davids, Wilhelmstrasse 10a, Hannover.

Designs

1,059,311. MACHINE FOR CORD TIRES. Continental Caoutchouc - und - Gutta - Percha Compagnie, Hannover.

1,059,993. FORMING AND VULCANIZING HEELS. Westland Gummiwerke G. m. b. H., Bredenscheid, i. W.

1,060,448. PRESSURE GAGE. Albert Drexler, Kochel a. See.

1,060,560. TIRE VULCANIZER. Firma Max Muller, Hannover-Hainholz.

1,060,598. PORCELAIN DIPPING MOLD. Fernand Bruggemann, Romanstrasse 55, Munich.

1,061,571. VULCANIZING BICYCLE TIRES. Max Muller, Maschinen-und-Formen Fabrik, Hannover-Hainholz.

1,061,812. MOUNTING TIRES. Bernhard Steffen, Allenstein, Ostpr.

†Not yet accepted.

1,062,233. VULCANIZING PRESS. Fried Krupp Gruson Werk, A. G., Magdeburg-Buckau.

1,062,455. SOLE REPAIR MOLD. Rudolf Wachsler, Vienna. Represented by E. Siebel, Ritterstrasse 36, Berlin S. 42.

1,062,456. SOLE REPAIR FORM. Rudolf Wachsler, Vienna. Represented by E. Siebel, Ritterstrasse 36, Berlin S. 42.

1,062,457. HEEL REPAIR FORM. Rudolf Wachsler, Vienna. Represented by E. Siebel, Ritterstrasse 36, Berlin S. 42.

1,062,571. TIRE ALARM. Paul Fellenberg, Mallinckrodtstrasse 267, Dortmund.

Process

United States

1,701,507. V-TYPE BELT. R. Roderwald, Berlin, Germany.

1,701,625. HAIR CARPET. B. Bronson, Lakewood, assignor to The Ohio Rubber Co., Cleveland, both in O.

1,701,891. OVERSHOE. G. L. Lawrence, Melrose, Mass.

1,701,896. BOOTS AND SHOES. R. Richard, Izeaux, France.

1,702,225. MAKING RUBBER ARTICLES. W. B. Wescott, assignor to Rubber Latex Research Corp., both of Boston, Mass.

1,702,705. ELECTRODEPOSITION OF RUBBER. J. Porter, Rothesay, Buteshire, Scotland.

1,702,957 and 1,702,958. GASKETS. F. N. Bard, Highland Park, Ill.

1,702,974. COLLAPSIBLE VALVE. W. W. MacDonald, Chicopee, Mass., assignor to A. G. Spalding & Bros., New York, N. Y.

1,703,312. FLOORING. J. B. Losey and W. R. Stone, Syracuse, N. Y.

1,703,476. TREADS. L. B. Conant, Cambridge, Mass., assignor, by mesne assignments, to Standard Patent Process Corp., a corporation of Mass.

1,704,186. TIRE BUILDING BANDS. J. R. Gammeter, Akron, O., assignor to The B. F. Goodrich Co., New York, N. Y.

1,704,538. CORE FOR SINGLE TUBE TIRES. S. C. Hatfield, Baltimore, Md.

Dominion of Canada

286,959. FASTENER FOR HEELS. L. Pignanelli, Tacoma, Wash., U. S. A.

United Kingdom

302,335† BUILDING TIRE COVERS. Goodyear Tire & Rubber Co., 1144 E. Market St., assignee of W. C. State, Fairlawn, both of Akron, O., U. S. A.

302,336† DEFLATING AIRTUBES. Goodyear Tire & Rubber Co., 1144 E. Market St., assignee of W. H. Campbell, 312 Glenwood Ave., both of Akron, O., U. S. A.

Germany

471,496. MAKING RUBBER GOODS. L. Szynkowski, Moltkestrasse 85, Cologne.

472,957. PRINTING RUBBERIZED FABRICS. Cantasilva, G. m. b. H., Leipzig-Leutzsch.

Chemical Patents

United States

1,701,946. COMPOUNDING RUBBER. The process comprises introducing more than one of the four vulcanizing ingredients, namely: dibenzylamine, a material containing carbon disulphide, zinc in combination, and sulphur.—S. M. Cadwell, Leonia, N. J., assignor to The Naugatuck Chemical Co., Naugatuck, Conn.

1,702,678. FIBROUS FLOOR COMPOSITION.—C. F. Willard, San Diego, Calif.

1,703,191. DYNAMO BRUSH COMPOSITION.—N. R. Haas, assignor, by mesne assignments, to Delco-Remy Corp., both of Dayton, O.

1,703,902. ACCELERATOR. A reaction product of di-phenyl-guanidine with 1 keto—2 methyl—4 thio—3,5 phendithiole.—W. Scott, assignor to The Rubber Service Laboratories Co., both of Akron, O.

1,703,920. COATING COMPOSITION. A solution of halogenated vulcanized rubber in benzol and solvent naphtha.—C. E. Bradley, Montclair, N. J., and W. A. Gibbons, New York, N. Y., assignors to The Naugatuck Chemical Co., Naugatuck, Conn.

1,704,194. RUBBER-LIKE SUBSTANCE. E. W. Hultman, assignor of one-fourth to each of the following persons: F. P. Duncklee, J. Monteleone and W. R. Simons, all of Los Angeles, Calif.

Dominion of Canada

287,011. ARTIFICIAL RUBBERS. Process for making artificial rubbers, comprising treating olefine hydrocarbons, with a finely divided or colloidal heavy metal oxide in aqueous suspension.—G. Farbenindustrie, A. G., Frankfort-on-Main, assignee of Helmuth Meis, Wiesdorf-on-Rhein, and Eduard Tschunker and Wilhelm Klein, both of Koln-Mulheim, all in Germany.

287,167. ARTIFICIAL LEATHER. Formation of a cellulosic fibrous paper web in which the fibers are loosely felted and impregnated with rubber.—The Brown Co., assignee of G. A. Richter, both of Berlin, N. H., U. S. A.

287,201. SYNTHETIC RUBBER. A process of producing synthetic rubber which comprises treating an unsaturated hydrocarbon adapted to be polymerized to produce rubber with an emulsifying agency and casein, and subsequently allowing the materials to stand at a temperature of 50° to 70° C. until polymerization takes place.—The Goodyear Tire & Rubber Co., assignee of R. P. Dinsmore, both of Akron, O., U. S. A.

287,504. TEAR RESISTING PAPER. In the process of beating paper-making fibers rubber latex is added in the presence of a protective colloid, the rubber is deposited on the fiber and formed into sheets.—The Dominion Rubber Co., Ltd., Montreal, assignee of R. P. Rose, Jackson Heights, and H. E. Cude, Floral Park, both in N. Y., U. S. A.

287,505. SATURATING PAPER. A process of paper making by which all non-cellulose materials are removed and plastic material is absorbed from an aqueous dispersion into the body of the paper.—The Dominion Rubber Co., Ltd., Montreal, assignee of R. P. Rose, Jackson Heights, and H. E. Cude, Floral Park, both in N. Y., U. S. A.

287,506. LEATHER SUBSTITUTE. Rubber is deposited from an aqueous suspension onto vegetable fiber, compacting the sheet formed and hot pressing it.—The Dominion Rubber Co., Ltd., Montreal, assignee of R. P. Rose, Jackson Heights, and H. E. Cude, Floral Park, both in N. Y., U. S. A.

United Kingdom

302,142.† ACCELERATOR. The reaction product of a 2 halogen benzothiazole and a dithio-carbamate.—The Goodyear Tire & Rubber Co., Akron, assignee of J. Teppema, Twin Oaks, both in O., U. S. A.

302,143.† ACCELERATOR. The reaction product of a benzoyl nitrophenyl sulphur halide, and an alkali salt of an organic sulphide.—The Goodyear Tire & Rubber Co., Akron, assignee of J. Teppema, Twin Oaks, both in O., U. S. A.

302,144.† ANTI-AGER. The reaction product of an aromatic amine and an aliphatic acid, or ester of such acid, is added to rubber to improve its ageing qualities.—The Goodyear Tire & Rubber Co., assignee of A. M. Clifford, both of Akron, O., U. S. A.

302,147.† ANTI-AGER. Rubber is preserved by the addition of a non-accelerating substituted phenyl or aryl hydroxy compound.—The Goodyear Tire & Rubber Co., assignee of A. M. Clifford, both of Akron, O., U. S. A.

302,176.† ACCELERATOR. A hydrolized halogen-free derivative of aldehyde-amine condensation products, the aldehyde being one having a plurality of carbon atoms in an open chain.—The Naugatuck Chemical Co., Naugatuck, Conn., assignee of S. M. Cadwell, 561 W. 58th St., New York, N. Y., U. S. A.

302,271.† ANTI-AGER. Secondary amines in which both of the hydrocarbon radicles are of the same series, preferably aryl are added to rubber to improve ageing qualities.—The Goodyear Tire & Rubber Co., assignee of A. M. Clifford, both of Akron, O., U. S. A.

302,935.† ATTACHING RUBBER TO METALS. The surface is first etched with a strong acid, then is applied a solution of rubber in amyl acetate, with or without carbon tetrachloride, to which swelling agents may be added.—F. Ahrens, Hildesheim, and Harzer Achsenwerke Ges., a. H. Bornum Konigsdahlum, both in Germany.

301,805.† STABILIZED LATEX.—Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij, 30, Carel van Bylandtlaan, The Hague, Holland.

301,893.† PLASTIC COMPOSITIONS.—Teltschik & Co., E. Jogsdorf, Silesia, Czecho-Slovakia.

† Not yet accepted.

Rubber Patents, Trade Marks and Designs

301,900.† CREPE SOLES.—Soc. Financière des Caoutchoucs, 13 Rue Notre Dame des Victoires, Paris, France.

301,901.† FLOOR AND WALL COVERINGS.—P. C. Van Der Willigen, 65 Noorderboofstraat, and Naamlooze Vennootschap Nederlandsche Linoleum-Fabriek, Padlam, both in Krommenie, Holland.

302,102. MULTI-COLORED SPONGE RUBBER.—Gummi und Balatawerke Matador, A. G., and F. Girg, 323 Karlsburgerstrasse, both in Petrzalka, Bratislava, Czecho-Slovakia.

302,151.† PLASTIC COMPOSITIONS.—Rubber Latex Research Corp., assignee of W. B. Wescott, both of Boston, Mass., U. S. A.

302,201. LATEX COAGULATING. — Dunlop Rubber Co., Ltd., London, D. F. Twiss and E. A. Murphy, Fort Dunlop, Birmingham,

302,250.† COATING RUBBER WITH METAL. A. Jenny, 36 Nollendorfstrasse, Berlin, Germany.

302,270.† COMPOSITION.—J. C. Patrick and N. M. Mnookin, both of Kansas City, Mo.

302,399. SYNTHETIC RUBBER.—J. Baer, 38 Oetlingerstrasse, Basle, Switzerland.

302,587.† SEALING CONTAINERS.—Dewey & Almy Chemical Co., assignee of B. Dewey and C. H. Egan, all of North Cambridge, Mass., U. S. A.

302,733.† SYNTHETIC RUBBER.—I. G. Farbenindustrie, A. G. Frankfort-on-Main, Germany.

302,887.† PHOTO-MECHANICAL PRINTING SURFACES.—Meisenbach, Riffarth & Co., A. G., Munich, Germany.

303,152.† SOLUTIONS.—British Celanese, Ltd., London, assignee of W. E. Crooks and C. D. Walton, Cumberland, Md., U. S. A.

Germany

471,833. VULCANIZING HOSE. Enrico Frattini, Turin. Represented by M. Abrahamsohn, Berlin S. W. 61.

471,879. ARTIFICIAL RUBBER. Dr. Eberhard Meyer-Busche, Markomannenstrasse 8, Cologne-Deutz.

General

United States

February 12, 1929*

1,701,566. NURSING BOTTLE. J. L. Havins, Baton Rouge, La.

1,701,573. OVERSHOE. G. L. Lawrence, Melrose, Mass.

1,701,611. SOLE. A. A. Glidden and T. M. Knowland, assignors to Hood Rubber Co., all of Watertown, Mass.

1,701,612. UPPER FOR OVERSHOES. A. A. Glidden, Watertown, and W. R. Hickler, Weston, assignors to Hood Rubber Co., Watertown, all in Mass.

1,701,625. TIRE PATCH. R. B. Luce, assignor to Continental Rubber Wks., both of Erie, Pa.

1,701,654. HYDROMETER. G. E. Anderson, Chicago, Ill.

1,701,733. RUBBER REENFORCING. C. Ferrettie, assignor to Mishawaka Rubber & Woolen Mfg. Co., both of Mishawaka, Ind.

1,701,872. HEEL BASE AND RUBBER HEEL. O. T. Crafts, Manchester, N. H.

1,702,003. STAMP PAD. C. C. Harris, assignor to Rivet-O Mfg. Co., both of Orange, Mass.

1,702,031. LEAK STOPPING DEVICE. W. J. Wesseler, E. Cleveland, O., assignor to Kex Co., Inc., St. Louis, Mo.

1,702,057. FLEXIBLE SHAFT COUPLING. T. E. Murray, Brooklyn, N. Y.

1,702,100. OVERSHOE. F. Wray, Akron, O., assignor to The B. F. Goodrich Co., New York, N. Y.

1,702,206. SAFETY FUSE. J. Fritzsche, Wiener-Neustadt, Austria.

1,702,233. NURSING BOTTLE. L. B. Frye, Atlanta, Ga., assignor to N. Derzis, trustee, Birmingham, Ala.

February 19, 1929*

1,702,332. ELECTRIC CABLE. R. Apt, Berlin-Treptow, Germany.

1,702,386. CUSHION TIRE BASE. H. W. Kranz, assignor to The Hydraulic Steel Co., both of Cleveland, O.

1,702,639. NONSKID TIRE. E. Langdon, San Francisco, Calif.

1,702,652. ELECTRICAL CONDUCTOR. G. T. Jones, Central Falls, assignor to Davis-Jones Insulated Wire Co., Pawtucket, both in R. I.

1,702,732. INFLATABLE VALVED BAG. M. W. Iden, Altona, Germany.

1,702,864. OVERSHOE. J. J. Gaughan, Arlington, assignor to Hood Rubber Co., Watertown, both in Mass.

1,702,882. HORSESHOE. R. R. Tweed, Audubon, N. J.

1,702,981. INFLATABLE AIR CONTAINER. M. B. Reach, Springfield, assignor to A. G. Spalding & Bros., Chicopee, both in Mass.

February 26, 1929*

1,703,238. SYRINGE. W. A. Hovis, Mountain Grove, Mo.

1,703,296. SPRING SHACKLE. T. P. Chase, assignor to General Motors Research Corp., both of Dayton, O.

1,703,297. RESILIENT CONNECTER. T. P. Chase, assignor to General Motors Research Corp., both of Dayton, O.

1,703,463. TOY BALLOON. R. E. Weigel, Berkeley, Calif.

1,703,593. TIRE BEAD ELEMENT. R. C. Pierce, assignor to National Standard Co., both of Niles, Mich.

1,703,734. TIRE ALARM. M. W. Henry, San Antonio, Tex.

* Under Rule No. 167 of the United States Patent Office, the issue closes weekly on Thursday, and the patents of that issue bear date as of the fourth Tuesday thereafter.

Rubber Patents, Trade Marks and Designs

March 5, 1929*

1,703,859. Fountain Syringes. H. A. Bauman and J. W. Higgins, Akron, O., assignors to The B. F. Goodrich Co., New York, N. Y.

1,704,048. Automobile Fender. F. L. Jordan, Weeks, La.

1,704,187. Sole. A. A. Glidden and T. M. Knowland, assignors to Hood Rubber Co., all of Watertown, Mass.

1,704,507. Stapling Machine. C. F. Kuch, Jr., Norwalk, Conn.

1,704,570. Suspension Parts. G. P. Lee, North Chicago, Ill., and W. T. Lewis, assignors to Western Coil & Electrical Co., both of Racine, Wis.

1,704,688. Overshoe. K. L. Valentine and G. Ramsey, Jersey City, N. J.

Dominion of Canada

February 5, 1929

286,926. Floor Finishing Apparatus. G. Geary, Toronto, Ontario.

286,990. Floor Wire. The Belden Mfg. Co., assignee of J. C. Belden, both of Chicago, Ill., U. S. A.

287,046. Tire Bead Element. The National Standard Co., assignee of R. C. Pierce, both of Niles, Mich., U. S. A.

February 12, 1929

287,127. Necktie. L. R. Holt, Menston, Yorkshire, England.

287,155. Sanitary Napkin Holder and Belt. I. S. Wallace, North Gower, Ontario.

February 19, 1929

287,301. Shoe and Gaiter. G. F. Powell, London, England.

287,302. Gaiter and Boot Protector. W. Reinhardt, Melsungen, Kassel, Germany.

287,306. Football Boot. E. Stahl, Dusseldorf, Germany.

287,342. Cable. Felten & Guilleaume Carlswerk Actien-Gesellschaft, Köln-Mulheim, assignee of G. Zapf, Köln, both in Germany.

February 26, 1929

287,445. Medicine Dropper or Syringe. J. U. Lloyd, Cincinnati, O., U. S. A.

287,451. Nursing Bottle. G. B. McMullen, Philadelphia, Pa., U. S. A.

287,518. Anti-Skid Device. The Letchford Rubber Co., Ltd., assignee of P. H. Letchford, both of Winnipeg, Manitoba.

United Kingdom

January 30, 1929

301,590. Vehicle Window. F. Biggs, 57 Tavistock Crescent, London.

301,591. Mercerizing Fiber. C. Ahnert, Masnon-Ocata, near Barcelona, Spain.

301,602. Driving Belt. H. Brammer, Vesper Mount, Vesper Rd., Kirkstall, and A. R. Jones, Stone Croft, Oakwood Grove, Roundhay, both in Leeds.

301,653. Insole or Sock. Eastern & Continental Trading Co., Ltd., and C. Pearce, 137 Edgware Rd., London.

301,725† Electric Switch. Siemens-Schuckertwerke Akt.-Ges., Siemensstadt, Berlin.

301,960. Loud-speaker. Sterling Telephone & Electric Co., Ltd., N. Blades and J. R. Beard, Marconi House, Strand, London.

302,008. Air Cushion. G. MacLellan & Co., Ltd., and F. Corner, Shuna St., Maryhill, Glasgow.

February 6, 1929

302,055. Road Vehicle. J. E. Seddon, 30 Rosemary Crescent, Whalley, Wigan.

302,092. Bathing Wrap. Isherwood Bros. of Radcliffe, Ltd., Spider Mill, and A. J. Isherwood, Windsor House, Bolton Rd., both in Radcliffe, Lancashire.

302,111. Sole. S. A. J. Holmquist, 4 Union Pl., Wells St., London.

302,145† Tire. Goodyear Tire & Rubber Co., 1144 E. Market St., assignee of B. Darrow, 880 Hereford Dr., both of Akron, O., U. S. A.

302,146† Valve. Goodyear Tire & Rubber Co., 1144 E. Market St., assignee of C. van Rennes, 153 Grand Ave., both of Akron, O., U. S. A.

302,190. Gramophone Pickup. Columbia Graphophone Co., Ltd., 102 Clerkenwell Rd., and F. A. Mitchell, Bendon Valley, Garratt Lane, both in London.

302,220† Game. A. Gueydan, Echandens, Vaud, Switzerland.

302,265. Ampoule. A. E. Smith, 1617 South Flower St., Los Angeles, Calif., U. S. A.

302,272† Tire. Goodyear Tire & Rubber Co., 1144 E. Market St., assignee of B. Darrow, 880 Hereford Dr., both of Akron, O., U. S. A.

302,293. Pipe Coupling. F. E. Roach, 5600 Roosevelt Rd., Chicago, Ill., U. S. A.

302,385. Brake. India-Rubber, Gutta-Percha & Telegraph Wks. Co., Ltd., 106 Cannon St., and W. L. Avery of India-Rubber, Gutta-Percha & Telegraph Wks., Silvertown, both in London.

302,407. Thermionic Valve Holder. G. A. Mathieu, 3 Mayfield Gardens, Shirehall Park, London, and S. B. Smith, 10 Tudor Ave., Chelmsford, Essex.

302,416. Powder Distributor. J. B. Copland, 5 Thornsett Rd., Anerley, London.

302,425. Pneumatic Seat. A. V. Mellano, 6 Queen's Dr., Thames Ditton, Surrey.

302,433. Electric Switch. L. Barrett, 2 St. Mary's Passage, Cambridge.

302,484. Road Vehicle. J. Eagles, 56 St. Mary's Rd., Doncaster.

February 13, 1929

302,513. Bust for Garment. V. Mortier, 29 Rue Caroly, Brussels.

302,618. Shock Absorber. F. G. G. Armstrong, North Bar St., Beverley, Yorkshire.

302,630. Aircraft. J. P. Davies, 39 Thornbury Rd., Isleworth, Middlesex.

302,647† Valve. Goodyear Tire & Rubber Co., 1144 E. Market St., assignee of C. van Rennes, 153 Grand Ave., both of Akron, O., U. S. A.

302,707. Vehicle Wheel. E. B. Killen, 27 Queen Victoria St., London.

302,731† Hat. Mezzera & Co., Soc. Anon., 28 Via Mauro Macchi, Milan, Italy.

302,751. Universal Joint. F. C. Russell (trading as Russell, Newbery & Co.), Grosvenor Rd., Altrincham, and J. H. Bradbury, Allanville, Doveston Rd., Ashton-on-Mersey, both in Cheshire.

302,797. Seat Back for Vehicle. G. D. Peters & Co., Ltd., and C. H. Cardwell, Windsor Wks., Slough, Buckinghamshire.

302,824. Securing Wheels on Shafts. British Thomson-Houston Co., Ltd., Crown House, Aldwych, London; C. J. Morton, Amulree, St. Paul's Rd., Coventry, and T. H. Woodfield, 85 Addison Rd., King's Heath, Birmingham.

302,832. Spray Carburetor. E. W. Bottle, 9 Binden Rd., Shepherd's Bush, London.

302,868. Furniture Tip. C. Gebhard, 1249 E. 56th St., Los Angeles, Calif., U. S. A.

302,877. Drop-delivery Device for Bottles. P. Weickel, 127 Lohrstrasse, Coblenz-on-Rhine, Germany.

February 20, 1929

302,951. Bracket for Shelf. W. F. and L. W. Offord, 21 York Villas, Brighton, and B. C. W. Windle, Manora, Hollington Park, St. Leonards-on-Sea.

302,959. Road. Universal Rubber Paviors, Ltd., and L. Gaisman, Canning St., Audenshaw, near Manchester.

302,991† Closure for Jam Jars. N. C. Neilsen, 33 Amagertorv, Copenhagen.

303,018† Non-skid Band. Wire Cord Hose Pipe Co., Wilmington, Del., assignee of D. M. Weigel, 120 B'way, New York, N. Y., both in the U. S. A.

303,033. Vehicle Lamp. J. Lucas, Ltd., O. Lucas and W. H. Egginton, Great King St., Birmingham.

303,057† Foot-arch Support. Scholl Mfg. Co., Ltd., Granville Sq., London, assignee of W. M. Scholl, 213 W. Schiller St., Chicago, Ill., U. S. A.

303,083. Valve. J. F. Duke, 8 Bagnall St., and W. R. Jones, 1 Albion Sq., both in Hanley, Stoke-on-Trent.

303,084. Trunk. P. C. A. Welsh, 4 Salisbury Ave., Antrim Rd., Belfast.

303,131† Electrostatic Loud-speaker. E. Reisz, 38 Goebenstrasse, Dahlem, Berlin.

303,140† Photography. Siemens & Halske Akt.-Ges., Siemensstadt, Berlin.

303,236. Vehicle Lamp. C. Tyrer, Park View, Flint Mountain, Flintshire.

303,255. Web Coating. J. Y. Johnson, 47 Lincoln's Inn Fields, London.—(J. Waldron Corp., N. J., U. S. A.)

303,260. Spring. G. A. Woodhead, The Grange, Old Park Rd., Roundhay, Leeds.

* Under Rule No. 167 of the United States Patent Office, the issue closes weekly on Thursday, and the patents of that issue bear date as of the fourth Tuesday thereafter.

† Not yet accepted.

Germany

471,163. ABDOMINAL BAND. Firma Wilhelm Julius Teufel, Neckarstrasse 189-193, Stuttgart.

471,272. RUBBER PAVING. Continental Caoutchouc-und Gutta-Percha Compagnie, Hannover.

471,459. PESSARY. Medicinisches Warenhaus A. G., Karlstrasse 31, Berlin N. W. 6.

471,512. INNER TUBE. Salvador Vidal-Topete, Lausanne, Switzerland. Represented by Dr. G. Winterfeld, Berlin S. W. 61.

471,648. MASK. Friedrich Karl Gimbel, Siegen, Westphalia.

471,916. TIRE TREAD. Continental Caoutchouc-und Gutta-Percha Compagnie, Hannover.

472,078. INFLATABLE BODY. Ora Krichbaum, Delaware, O., United States. Represented by Hans Heimann, Berlin S. W. 61.

472,261. TIRE PROTECTOR. Wilhelm Decker and Karl Kotzian, Koszeg, Guns, Hungary. Represented by A. Kuhn, Berlin S. W. 61.

472,332. TOY FIGURE. Ungarische Gummiwarenfabriks A. G., Buda-Pest. Represented by Dr. E. Boas and W. Fritze, Berlin S. W. 61.

472,650. CUSHION TIRE. Johann Josef Kieber and Johann Josef Thöny, Schruns, Vorarlberg, Austria. Represented by Martha Ruhlmann, Hartelstrasse 25, Leipzig, C. 1.

473,073. BELT FOR MOTOR VEHICLES. Maschinenfabrik Esslingen, Wurttbg.

Designs

1,056,471. HEEL WITH LEATHER INSERT. Franz Jochim, Arnulfstrasse 37, Ludwigshafen a. Rh.

1,056,560. POLICEMAN'S CLUB. Continental Caoutchouc und-Gutta-Percha Compagnie, Hannover.

1,056,672. ANTI-SKID SOLE. Artur Materna, Lutzowstrasse 80, Berlin W. 35.

1,056,700. HAMMER. Norddeutsche Gummiwaren-Fabrik Hannover, G. m. b. H., Hannover-Dohren.

1,056,835. BENZINE TUBE. Internationale Asbest-Gummi-und Kaltleim Industrie G. m. b. H., Hamburg 37.

1,056,913. GAITER. Siegfried Juda, Xantenerstrasse 19, Berlin W. 15.

1,057,038. SOLING. Otto Korting, Hameln.

1,057,096. WINDOW CLEANER. Ernst Kilchhofer, Zurich, Switzerland. Represented by A. Kuhn, Berlin S. W. 61.

1,057,128. HARD RUBBER PISTOL. Alfred Menz, Buhl.

1,057,197. HORSESHOE PEGS. Gustav Menzel, Seiffersdorf, Kr. Schonau.

1,057,888. GARMENT PROTECTOR. Firma M. Steinberg, Koln-Lindenthal.

1,057,904. PACIFIER WITH VOICE. Hermann Sieder, Sonneberg i. Th.

1,057,939. STOCKING. Oskar Rost, Dittesstrasse 36, Plauen i. V.

1,057,972. STOCKING. Vulkan Gummiwarenfabrik Weiss & Baessler, A. G., Leipzig-Lindenau.

1,058,257. HEEL. Firma Joseph Bayer, Admiralitatstrasse 71-72, Hamburg 11.

1,058,271. COAT WITH POROUS LINING. M. Mathias & Co., Lindenstrasse 18-20 Konigsberg i. Pr.

1,058,350. HEEL. Otto Tillmann, Schwelm i. W.

Rubber Patents, Trade Marks and Designs

1,058,487. PROTECTORS FOR UTENSILS. Bernhard Hannemann, Pulsnitz i. S.

1,058,765. DISK BALL. Verelnigte Gummiwaren-Fabriken Wimpassing, vorm. Menier J. N. Reithoffer, Wimpassing, Lower Austria. Represented by W. Zimmermann and E. Jourdan, Berlin S. W. 11.

1,058,888. PROTECTIVE COVERING. Oskar Brandeis, Pestalozzistrasse 49, Berlin-Charlottenburg.

1,058,964. HOLLOW BAND. Sanatola-Gesellschaft Pohl & Co., Oranienstrasse 117-118, Berlin S. W. 68.

1,058,970. BRUSH. Wilhelm Rothert, Steglitzerstrasse 56, Berlin W. 35.

1,058,977. COUPON RING. Hermann Kramer, Bambergerstrasse 41, Dresden A-27.

1,059,060. BATHING HELMET. C. Muller Gummiwarenfabrik A. G., Berlin-Weissensee.

1,059,243. HOT WATER BOTTLE. Friedrich Emil Kraus, Schwarzenberg i. S.

1,059,415. STOCKING. Firma Franz Anton, Zeulenroda i. Thuringia.

1,059,533. HEEL. Westland Gummiwerke G. m. b. H., Bredenscheid i. W.

1,059,588. SADDLE FOR MOTOR CYCLES. Continental Caoutchouc-und Gutta-Percha Compagnie, Hannover.

1,059,590. HOT WATER BOTTLE. Firma Philipp Herz, Windsheim, Mittelfr.

1,059,605. BATHING HELMET. C. Muller Gummiwarenfabrik, A. G., Berlin-Weissensee.

1,060,005. BATHING CAP. Continental Caoutchouc-und Gutta-Percha Compagnie, Hannover.

1,060,595. RUBBER LEAD CABLE. Rheinische Draht-und Kabel Werke, G. m. b. H., Cologne-Riehl.

1,060,621. SHOCK ABSORBER FOR INSTRUMENTS. Robert Abrahamsohn, G. m. b. H., Turmstrasse 70, Berlin N. W. 87.

1,061,037. HEEL. Friedrich Krieger, Cronenberg, Rhld., Post Hahnerberg.

1,061,229. CLEANING BRUSH. Friedrich Kressmann, Blumenthalstrasse 37, Berlin O. 112.

1,061,585. SAFETY TIRE. Max Petzold, Neubrockwitz b. Meissen.

1,061,668. RUBBER HANDKERCHIEF CASE. Magarethe Bier (née, Wolf), Dasselstrasse 61, Cologne.

1,061,764. TANK HOSE. Schwabe & Staats, Gotha.

1,061,796. TIRE VALVE. Hans Sikora, Dusseldorferstrasse 194, Dusseldorf-Oberkassel.

1,061,797. ANTI-SKID DEVICE. Franklin-Seelemann, Neustadt-Orla.

1,061,866. SHOE HEEL COVER. Ferdinand Fuhrmann, Rheda, Bez. Minden.

1,061,916. COLLAPSIBLE BOAT. A. G. Metzeler & Co., Munich.

1,062,143. CLEANER FOR TUBES. Erfurter Brauereibursten & Brauereiartikelfabrik Gebruder Schonert, Magdeburgerstrasse 27, Erfurt.

1,062,564. SOLID TIRE. Franz Clouth Rheinische Gummiwarenfabrik, A. G., Cologne-Nippes.

1,062,738. HEEL. Walter Gotze, Lessingstrasse 30, Halle a. d. S.

1,062,824. HANDLE FOR MICROTELEPHONE. Dr. Heinr. Traun & Sohne, vorm. Harburger Gummi-Kamm-Compagnie, Hamburg.

1,063,016. DRIVING BELT. Continental Caoutchouc-und Gutta-Percha Compagnie, Hannover.

1,063,072. FABRIC FOR COLLAPSIBLE BOATS. Franz Clouth Rheinische Gummiwarenfabrik A. G., Cologne-Nippes.

1,063,079. CLASP FOR BOBBED HAIR. Georg Brunnert, Brunnen i. O.

1,063,135. BATHING CAP. H. Pottbeckers, Hagdorn, 36, Mulheim, Ruhr.

1,063,198. HONE CONTAINER. Richard Ronge, Pilkendorf, b. Koppitz, O. S.

Trade Marks

United States

Two Kinds of Trade Marks Now Being Registered

Under the rules of the United States Patent Office, trade marks registered under the Act of February 20, 1905, are, in general, fanciful and arbitrary marks, while those registered under the Act of March 19, 1920, Section (1) (b) are non-technical, that is, marks consisting of descriptive or geographical matter or mere surnames. To be registered under the later act, trade marks must have been used for not less than one year. Marks registered under this act are being published for the first time when registered, any opposition taking the form of an application for cancellation.

February 12, 1929

Act of February 20, 1905

252,665. ROYTYPE—rubber keys and cushion feet for typewriting machines, and rubber twirler knobs and rings for typewriter platens. Royal Typewriter Co., Inc., New York, N. Y.

252,783. SPHINX, with representation of the Sphinx—prophylactic rubber articles. L. Hilsenbeck, Inc., New York, N. Y.

Act of March 19, 1920

252,837. WINDSOR—pneumatic tires and tubes. The Fisk Rubber Co., Chicopee Falls, Mass., and Cudahy, Wis.

252,840. "BLAST-PROOF"—rubber hose. Mountain States Rubber Co., Salt Lake City, U.

252,868. YE OLDE ENGLISH, in Old English type—tires and tubes. English Tire Co., Inc., Brooklyn, N. Y.

February 19, 1929

Act of February 20, 1905

252,897. Oval shield colored red with words "SUPER" and "TRACTION" printed thereon, and two spaced-apart longitudinal lines extending across the face of the shield and contacting at the ends with a border line around the edge of the shield—tires. Raritan Rubber, Inc., New Brunswick, N. J.

252,898. Oval shield colored red with the word "RARITAN" printed and enclosed in parallel longitudinal lines, which at their ends contact with a border line around the edge of the shield—tires. Raritan Rubber, Inc., New Brunswick, N. J.

Rubber Patents, Trade Marks and Designs

252,907. Representation of a pestle and mortar around and on which are the words: "For Reliability Buy This Merchandise from Your Druggist Only"—prophylactic rubber articles. Vivian W. Crawley, Chicago, Ill.

252,936. Representation of a dragon holding in one claw a monogrammed shield, beneath the representation the words: "Semper Sursum"—rubber receptacles for acids, ink, etc. Dr. Heinr. Traun & Söhne, vormals Harburger Gummi-Kamm-Compagnie, Hamburg, Germany.

252,943. Redtop—rubber type. The Superior Type Co., Chicago, Ill.

252,946. Le Cygne—infant pacifiers. Samuel D. Kramer, doing business as Kramer Novelty Co., New York, N. Y.

253,152. Representation of sheet of rubber with color combination of white, blue, and white on the edges of the packing material—tire patches. Miller Motors Specialties, Inc., Dallas, Tex.

Act of March 19, 1920

253,217. Representation of a pulley partially covered and on this covering the words: "Sure Grip"—chemically and mechanically prepared canvas coverings for preventing slippage. Sure Grip Pulley Covering Co. of America, Philadelphia, Pa.

February 26, 1929

Act of February 20, 1905

253,219. All Year—tires, tubes, and tire covers. Merchants Tire Co., St. Louis, Mo.

253,347. "M. R. W." above the word: "Tuxedos"—prophylactic rubber articles. Murch R. Cady, Grand Rapids, Mich.

253,348. English Checkers—prophylactic rubber articles. Murch R. Cady, Grand Rapids, Mich.

253,473. Airflex—tires. United States Rubber Co., New York, N. Y.

253,487. Solid colored block containing the words: "Western Weld"—adhesive cement for tire patches, boots, etc. Western States Mfg. Co., Sioux City, Iowa.

253,530. NoMar—driver's shoe heel rest for auto vehicles. Eno Rubber Corp., Los Angeles, Cal.

Act of March 19, 1920

253,569. Airtite—cold patches for inner tubes. Ward-Dossett-Floyd Co., Waco, Tex.

March 5, 1929

Act of February 20, 1905

253,624. Representation of rubber heel on which are the words: "Wearplus Cushion"—rubber heels. Harry Weinberger, New York, N. Y.

253,638. Queen Quality Nursease, each word on a separate line, with the first two in script having a single initial "Q"—boots, shoes, and slippers of leather, rubber, felt, etc. Thomas G. Plant Corp., Boston, Mass.

253,647. Oval containing the word "Boss," beneath the oval the word: "Harvester"—gloves and mittens of fabric and combinations of rubber and fabric. The Boss Mfg. Co., Kewanee, Ill., and Brooklyn, N. Y.

253,686. Excelsior—combs. Hanover Rubber Co. "Excelsior," Inc., New York, N. Y.

253,708. Bearfoot—soles of rubber composition for boots and shoes. The Bearfoot Sole Co., Inc., Boston, Mass.

253,709. Decorative oval containing the words: "The Dolly Shoe"—shoes of leather, rubber, fabric, etc. H. Childs & Co., Inc., Pittsburgh, Pa.

253,711. A design embracing the letters "K I X" and the Firestone trade mark: the letter "F" in a shield below which are the words: "The Mark of Quality"—footwear of rubber, fabric, and rubber and fabric. Firestone Footwear Co., Hudson, Mass.

253,733. A blue diamond containing the words: "Blue Goodyear Diamond"—rubber boots and shoes. Phillips-Baker Rubber Co., Providence, R. I.

253,734. A black diamond containing the words: "Black Goodyear Diamond"—rubber boots and shoes. Phillips-Baker Rubber Co., Providence, R. I.

253,760. Arch-Controller—boots and shoes of leather, rubber, fabric, etc. Ideal Shoe Mfg. Co., Milwaukee, Wis.

253,785. Snap-O-Spat—gaiters. William Greilich & Sons, Inc., Brooklyn, N. Y.

253,787. Sun-Kist, with a representation of the sun and its rays in the lower loop of the letter "S"—bathing shoes, bathing caps, and bathing capes. The Asbury Mills, New York, N. Y.

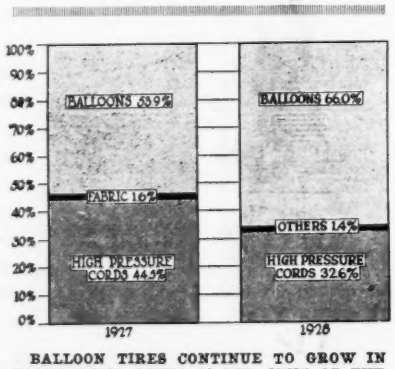
Act of March 20, 1920

253,906. Chatham—boots and shoes of leather, rubber, and textile fabrics, etc. Kresge Department Store Corp., Newark, N. J.

Dominion of Canada

February 5, 1929

45,501. Word: "Winterized"—goods manufactured wholly or partly of rubber, rubber compositions, or rubber substitutes. Dunlop Tire & Rubber Goods Co., Ltd., Toronto, Ont.



BALLOON TIRES CONTINUE TO GROW IN POPULARITY, BEING 66 PER CENT OF THE WHOLE TIRE PRODUCTION IN 1928, COMPARED WITH 53.9 PER CENT IN 1927.—AUTOMOTIVE INDUSTRIES.

February 12, 1929

45,518. Word: "Gum-Dipped"—resilient vehicle tires of rubber, rubber composition, or rubber and fabric. Firestone Tire & Rubber Co. of Canada, Ltd., Hamilton, Ont.

February 26, 1929

45,636. Word: "Clifton" surrounded by a double oval line—rubberized textile fabrics including rubberized duck. Clifton Manufacturing Co., Boston, Mass., U. S. A.

United Kingdom

February 6, 1929

496,014. Lecoid — Compounds composed principally of gutta percha or india rubber, for sealing electric cable boxes and for the like purposes. The Liverpool Electric Cable Co., Ltd., Linacre Lane, Bottle, Liverpool.

497,200. Alphabetta—devices consisting of inverted cups made of india rubber for affixing advertisements, etc., to shop windows. Wedekind & Co., 28, Cock Lane, London, E. C. 1.

498,174. Poncrest—goods manufactured from india rubber and gutta percha not included in other classes. John Barker & Co., Ltd., trading as Pontings, 123-127, Kensington High St., London, W. 8.

498,338. Devart—boots and shoes. Dominion Rubber Co., 47-48, Farringdon St., London, E. C. 4.

February 13, 1929

491,430. Vulcalock—goods manufactured from india rubber and gutta percha not included in other classes. The B. F. Goodrich Co., New York, N. Y., U. S. A.

Designs

United States

77,546. Tire. Term 14 years. Tully Graybill, assignor to Kelly-Springfield Tire Co., both of Cumberland, Md.

77,601. Tire. Term 7 years. H. C. Hower, Chicago, Ill.

77,644. Tire. Term 14 years. Nicholas La Jone, assignor to Inland Rubber Co., both of Chicago, Ill.

77,665. Hot Water Bottle. Term 14 years. Harry A. Bauman, Akron, O., assignor to The B. F. Goodrich Co., New York, N. Y.

77,690. Tire. Term 3½ years. William E. Greer, assignor to The Akron Standard Mold Co., both of Akron, O.

77,832. Tire. Term 14 years. Robert P. Harvey, Springfield, assignor to The Fisk Rubber Co., Chicopee Falls, both in Mass.

77,836. Tire. Term 14 years. Robert Iredell, assignor to The General Tire & Rubber Co., both of Akron, O.

Dominion of Canada

8,166—8,167—8,168—8,169. Tire. Dominion Rubber Co., Ltd., Montreal, Que.

MARKET REVIEWS

CRUDE RUBBER

New York Exchange

MARCH 1. The market was quiet reflecting a softer undertone in London, and the earlier declines of about 50 points were not maintained. There was a complete recovery towards noon and finally sold off to about 50 to 60 points below Thursday's close. Closing prices: Mar. 25.60; May 26.10; July 26.30; Sept. 26.40; Dec. 26.60.

MARCH 2. Due to heavy foreign markets and further renewal of selling on the Rubber Exchange, all positions sold off 20 to 30 points. Losses during the first hour ran from 50 to 60 points, when all positions were offered in liberal volume, May, July, September, and October positions going below the 26-cent level. Towards the close, however, support steadied the market and rallies from 30 to 40 points were marked up, July, September, and October again recovering to above the 26-cent level. Closing prices: Mar. 25.40; May 25.80; July 26.00; Sept. 26.10; Dec. 26.30.

MARCH 4. Prices advanced another 40 to 50 points influenced by surprising strength of London where manufacturing interests were reported good buyers. On the advance all positions were easily absorbed. London closed ¾ pence to ⅝ pence higher. Closing prices: Mar. 25.80; May 26.20; July 26.40; Sept. 26.50; Dec. 26.80.

MARCH 5. The market was rather quiet and more caution observed in all operations. Prices fluctuated within a narrow range, closing practically the same as Monday's figures on all positions. However, the buying was of better character than the selling and certain dealers quietly picked up fair weights, withdrawing buying orders where prices advanced too much and were only in the market on a setback. Closing prices: Mar. 25.80; May 26.40; July 26.50; Sept. 26.70; Dec. 26.80.

MARCH 6. Market still very quiet and uncertain, with prices closing 10 points lower on future positions, about the same as Tuesday's close. Closing prices: Mar. 25.70; May 26:30; July 26.50; Sept. 26.70; Dec. 26.80.

MARCH 7. A bear raid forced prices down about ½ cent, but good support was encountered by trade factors and dealer interests. The recovery was feeble and the market closed near the lows. Manufacturers' demand for actual rubber was limited and the rubber invoices to the United States were surprisingly heavy for the week ended March 2. The London market was also slightly lower. All these factors were on the bearish side. Closing prices: Mar. 25.40; May 25.90; July 26.10; Sept. 26.30; Dec. 26.40.

MARCH 8. A series of irregular movements resulted in an easy close, all positions being down about 40 points. Pool interests were trying to depress the market in order to bring out offers from the primary markets, but London closed unchanged and Singapore ¼ pence lower. Closing prices: Mar. 25.20; May 25.50; July 25.80; Sept. 25.90; Dec. 26.20.

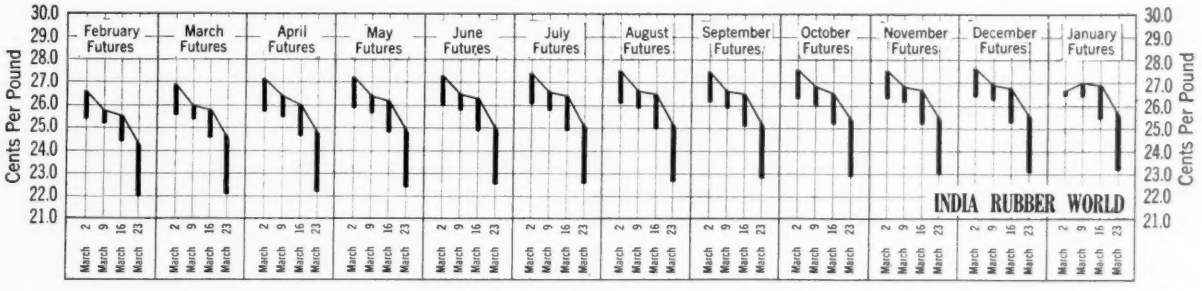
MARCH 9. Large interests tried to depress the market and were successful to a certain extent, although offers were quickly picked up. Saturday prices were slightly higher. Closing prices: Mar. 25.30; May 25.70; July 26.00; Sept. 26.20; Dec. 26.30.

MARCH 11. London was firm and higher on all positions, with Singapore firm and prices recovering 50 to 60 points. It was rumored that certain London houses had buying orders for 100 tons per month on the spread of three positions, which was understood to be purchased orders against the over sold position in eastern markets. Trade was extremely dull and at a standstill part of the time. Closing prices: Mar. 25.50; May 26.00; July 26.30; Sept. 26.50; Dec. 26.70.

MARCH 12. Market slightly lower and trade dull and uninteresting, with prices down from 30 to 50 points at certain periods of the day, closing from 10 to 20 points lower in the final analysis. The market seemed bare of supporting orders the greater part of the day with the result that large operators had little trouble bringing out depressions. Closing prices: Mar. 25.40; May 25.80; July 25.90; Sept. 26.20; Dec. 26.40.

MARCH 13. The Rubber Association's consumption figures for February showed a consumption of 41,494 tons, a new record for a short month and comparing with the consumption for January of 43,000 tons and February last year of 33,702 tons, showing an advance of 7,792 tons over February's consumption last year. Although the market responded to these figures at the

New York Rubber Exchange—High and Low Monthly Futures



The Rubber Exchange of New York, Inc.

DAILY MARKET FUTURES—RIBBED SMOKED SHEETS—CLOSING PRICES—CENTS PER POUND—"A" CONTRACTS

Positions 1929	February, 1929 25	26	27	28	March, 1929 1	2	4	5	6	7	8	9	11	12	13	14	15	16	18	19	20	21	22	23
March ...	26.4	26.6	26.1	26.3	25.6	25.4	25.8	25.8	25.7	25.4	25.2	25.3	25.5	25.4	25.1	24.6	24.7	24.4	24.3	24.2	22.8	23.4	23.2	22.0
April	26.7	26.9	26.4	26.5	25.9	25.6	26.0	26.0	26.0	25.7	25.4	25.6	25.8	25.6	25.3	24.7	24.9	24.6	24.6	24.4	22.8	23.6	23.2	22.1
May	26.9	27.1	26.6	26.6	26.1	25.8	26.2	26.4	26.3	25.9	25.5	25.7	26.0	25.8	25.5	24.8	25.0	24.7	24.8	24.5	22.9	23.8	23.3	22.2
June	27.0	27.2	26.7	26.7	26.2	25.9	26.3	26.4	26.4	26.0	25.7	25.9	26.2	25.9	25.6	24.9	25.1	24.8	24.9	24.7	23.1	24.0	23.4	22.4
July	27.0	27.3	26.7	26.8	26.3	26.0	26.4	26.5	26.5	26.1	25.8	26.0	26.3	25.9	25.7	25.0	25.2	24.9	25.0	24.8	23.2	24.1	23.5	22.5
August ..	27.2	27.4	26.8	26.9	26.4	26.1	26.5	26.6	26.6	26.2	25.8	26.1	26.4	26.0	25.8	25.0	25.3	24.9	25.1	24.8	23.3	24.2	23.7	22.6
September	27.3	27.5	26.9	27.0	26.4	26.1	26.5	26.7	26.7	26.3	25.9	26.2	26.5	26.2	25.9	25.1	25.3	25.0	25.2	24.9	23.5	24.3	23.8	22.7
October ..	27.2	27.5	26.9	27.0	26.4	26.2	26.6	26.7	26.7	26.3	25.9	26.2	26.5	26.2	26.0	25.1	25.4	25.1	25.2	24.9	23.6	24.4	23.8	22.8
November	27.3	27.6	27.0	27.0	26.6	26.3	26.7	26.8	26.7	26.4	26.0	26.3	26.6	26.3	26.1	25.2	25.5	25.2	25.4	25.0	23.7	24.5	24.0	22.9
December .	27.4	27.6	27.0	27.0	26.6	26.3	26.8	26.8	26.8	26.4	26.2	26.3	26.7	26.4	26.1	25.2	25.6	25.3	25.4	25.1	23.7	24.5	24.1	23.0
1930																								
January ..	27.5	27.7	27.1	27.1	26.7	26.4	26.9	26.9	26.9	26.5	26.3	26.4	26.8	26.5	26.2	25.3	25.7	25.4	25.5	25.2	23.9	24.6	24.2	23.1
February .	....	....	....	....	26.7	26.5	27.0	27.0	27.0	26.6	26.4	26.5	26.9	26.6	26.3	25.4	25.8	25.5	25.6	25.3	24.0	24.7	24.3	23.2

opening and prices were 30 to 40 points higher on practically all positions, and in some positions 60 points higher due to active buying on the account of shorts and those bullishly inclined, yet, on this advance fairly large offerings appeared in the market, until prices finally closed about 30 points lower from the previous day, and about 60 to 70 points from the high of the day. It was a surprise to those bullishly inclined. Closing prices: Mar. 25.10; May 25.50; July 25.70; Sept. 25.90; Dec. 26.10.

MARCH 14. With lower cables from London the market continued to decline, closing with a net loss of 50 to 90 points, and fairly heavy trading in all positions. Closing prices: Mar. 24.60; May 24.80; July 25.00; Sept. 25.10; Dec. 25.20.

MARCH 15. On Friday, there seemed to be a slight recovery but due to the fact that many who had sold short on this break apparently did not desire to carry commitments over the week-end and good buying began, with the result that prices were 40 to 50 points up from the low, with a net advance of 10 to 20 points from Thursday's close. Closing prices: Mar. 24.70; May 25.00; July 25.20; Sept. 25.30; Dec. 25.60.

MARCH 16. There was extremely heavy trading which amounted to 1,599 contracts or about 4,000 tons, chiefly confined to May and July. Yet, these and the other trading months showed a decline of 30 to 40 points, helped also by a further slight decline in the London market. Trading was done in volumes of 50 to 60 contracts at a time and seemed confused and nervous, many not knowing the cause of the heavy business. It was rumored there was a war on between certain trading factors in the market. The net result was that the market closed easier, weak and rather depressed. Closing prices: Mar. 24.40; May 24.70; July 24.90; Sept. 25.00; Dec. 25.30.

MARCH 18. Trading was quieter and the heavy selling of Saturday, which apparently was absorbed by large factors, had ceased. Selling continued, on a very much smaller scale and offers made at the market were quietly absorbed. Closing prices: Mar. 24.30; April 24.60; May 24.80; June 24.90; July 25.00; Aug. 25.10; Sept. 25.20; Oct. 25.20; Nov. 25.40; Dec. 25.40.

MARCH 19. With London quiet and slightly easier, opening prices were practically on Monday's close, yet trade seemed reserved and it was some time before the market really developed. There was little indication of speculative or factory buying. The London market closed slightly easier causing prices here to drop 30 to 40 points on every position. At the close, there seemed a fair buying power with a slight rally of 10 points. Closing prices: Mar. 24.20; May 24.50; July 24.80; Sept. 24.90; Dec. 25.10.

MARCH 20. With lower London cables the market opened weaker, prices being off about 40 to 50 points and at this decline support was in evidence from factory interests resulting in a fairly steady market around noon. The report that some Singapore house was in trouble caused heavy selling and the withdrawal of uptown support, with the result that prices eased off and continued easy all afternoon with prices receding on each sale, catching many stop-loss orders and also distress selling by weak margin accounts. Prices continued to be easy and closed very weak with losses for the day of 100 to 160 points. Trading was heavy and the day's sales were 2,565 lots or 6,417 tons. There were also 119 transferable notices making 1,672 to date. The market was demoralized at times and trade was extremely mixed at the close. Closing prices: Mar. 22.80; May 22.90; July 23.20; Sept. 23.50; Dec. 23.60.

MARCH 21. After the drastic decline of Wednesday, prices opened steady and about 20 points higher on all positions as the London market was only ⅛ pence lower than the previous close. This caused a little hesitancy on the part of those looking for further decline and it was also understood that a number of foreign buying orders were in the market; so there was no weakness as compared with Wednesday. The report of the previous day that a Singapore house was in trouble was absolutely denied, and this together with shorts covering and others who thought rubber was a purchase, found it rather difficult to buy at what they thought low prices.

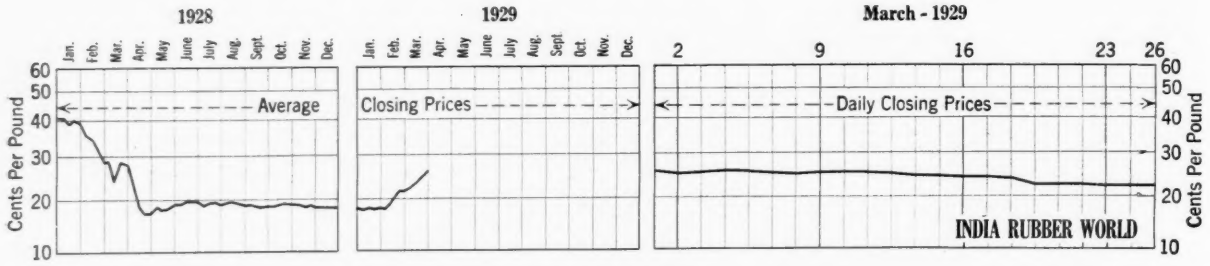
As the day progressed with the foreign market steady and not inclined to sell, prices stiffened, there was buying in every position, and some rather urgent short covering and good trade buying occurred so that prices finally closed at 80 to 90 points higher in practically every position.

It was an absolute turn around of the previous day and those who dumped rubber yesterday were forced to pay higher prices to enter the market again. Trading was heavy 1,798 lots or 4,495 tons. Closing prices: Mar. 23.40; May 23.80; July 24.10; Sept. 24.30; Dec. 24.50.

MARCH 22. The market was a rather dull and drab affair, London coming over fairly steady although Singapore prices had advanced to parity with this market. Trading was dull and inactive, opening prices being about 20 points lower from Thursday's close. Due to lack of interest and information of any importance the market eased off about 20 points from the high and about 50 points from the previous close, with buyers and seller about even at the close. Closing prices: Mar. 23.10; May 23.30; July 23.60; Sept. 23.80; Dec. 24.10; with buyers 10 points lower in each position.

MARCH 23. London prices were quoted at 11¼ pence, about ⅛ pence down from

New York Outside Market—Spot Closing Prices Ribbed Smoked Sheets



New York Outside Market—Spot Closing Rubber Prices—Cents Per Pound

PLANTATIONS	February, 1929				March, 1929																
	25	26	27	28	1	2	4	5	6	7	8	9	11	12	13	14	15	16	18	19	20	21	22	23
Sheet																								
Ribbed smoked	26¾	26⅞	26¼	26⅜	26⅛	25½	25⅜	26⅛	25⅞	25⅝	25⅜	25⅝	25⅝	25½	25¼	24⅝	24¾	24½	24½	24¼	22⅞	23⅜	23	22¼
Crepe																								
First latex	27¼	27⅜	26¾	26⅞	26½	25⅞	26⅛	26½	26½	26	25¾	26	26⅛	26	25¾	25	25	24⅞	24⅝	24½	23¾	23⅞	23½	22¾
"B" blanket	24½	24⅜	24⅛	24	23¾	23⅛	23¾	23¾	23½	23¼	22⅞	23⅛	23⅜	23⅛	22⅞	22¼	22¼	22	21⅞	21¾	20¾	20⅝	20⅜	19¾
"C" blanket	24⅛	24⅛	23⅞	23¾	23½	23½	23½	23⅝	23½	22⅞	22⅝	22⅞	23⅛	22⅞	22⅝	21⅞	22	21¾	21⅝	21¼	20½	20⅜	20¼	19⅜
"D" blanket	23½	23¼	23½	23⅛	23⅛	23⅛	23⅛	23⅛	22⅞	22½	22	22⅜	22¾	22⅜	22⅛	21½	21⅝	21¼	21¼	20⅞	19⅝	19⅞	19¾	18⅞
No. 2 brown	24⅛	24¼	23⅞	23¾	23½	23⅛	23½	23⅝	23¼	22⅞	22⅝	22¾	23⅛	22¾	22½	21⅞	22	21⅞	21⅝	21⅜	20⅛	20⅜	20⅛	19⅜
Rolled brown	19⅞	19¾	19⅛	19⅛	19	18¾	19	19¼	19¼	18⅞	18⅜	18⅝	18½	18¼	18⅛	17¾	18	17⅜	17	16½	16	16⅛	15⅞	15½
Off latex	26⅞	26¾	26⅜	26⅜	26⅛	25½	25⅞	26¼	25⅞	25¾	25½	25⅜	25¾	25⅜	25⅜	24⅝	24¾	24⅝	24⅜	24¼	22⅞	23⅜	23⅛	22⅜

Friday's close, and Exchange prices opened off about 20 to 30 points from the previous close remaining fairly steady. There was very little trading during the first hour. As the day progressed, for some unknown reason, further distress selling entered the market and with no support prices declined with the result that all active positions fell rapidly being down 70 points from the high of the day and at the final close, 100 to 110 points down from the previous close. It was thought that the high inventory in tires, together with the credit situation was the cause of this distress selling. The market closed weak with more sellers than buyers at the closing prices which were: Mar. 22.00; May 22.20; July 22.50; Sept. 22.70; Dec. 23.00.

It is very difficult to find out any real cause for the drastic declines and liquidation in the past week, as the consumption of rubber and the statistical situation has undergone no material change. It seems as if the weak holders and buyers continue to press the market which causes continued liquidation. London stocks increased 800 tons and arrivals at all ports for March is estimated at about 49,000 tons.

New York Outside Market

At the beginning of March, factories were waiting for inventories and watching the market as the month progressed. On the decline which occurred during the first week of March, large factories were good buyers in the Far East, but could not obtain all the rubber necessary. Brokers with eastern connections were unable to obtain the full amount of rubber required on bids, and practically every offer received from the Far East was high and quantities reduced whenever a sale was made.

MARCH 9. The market for the week was quiet, although there was some factory buying of nearby rubber. The general trade marked time, waiting for further developments, with the result that prices closed about ⅛ cent lower on all grades and all positions.

MARCH 16. Heavy trading on the Exchange at lower prices, caused factories to lose interest, and when the expected tire advance did not materialize, the disappointed longs sold rubber and a further decline was noticed.

MARCH 18. The market was quiet and prices eased off ⅛ cent. Factories expected to buy at lower figures, and hesitated about making commitments even at low prices. On March 19 prices declined ½ cent further and remained fairly steady at these figures. The trade semed confused as to what the ultimate price of rubber might be and it is difficult to tell what the large operators may determine is a fair price for rubber.

MARCH 19. Little factory buying was in evidence, which with the continued weakness of the Exchange induced little buying and prices eased off about ½ cent for every grade and position, although there seemed a fair demand for the nearby rubber.

MARCH 20. Slightly lower London cables and continued weakness on the Exchange carried prices down. Actual rubber sold off rapidly and a decline of 1¼ cents on practically every grade and position was noted. There was little consumer support, especially, as the factories did not care to buy on a declining market not knowing where it would end. In the late afternoon it was understood there was fair factory buying, and especially by operators who had bought fair quantities of nearbys at their price.

MARCH 21. With London and the Exchange steady, large interests again picked up all the rubber offered and bid for more. Bids made to the Far East and London at fair prices were not accepted, and the market tightened up, some dealers refusing to offer rubber at any price. This caused further tightening, and the fact that those with London connections were buyers in this market caused an advance about ½ cent for all grades and positions so that the market closed firm with buyers and few sellers in evidence as they preferred to wait and see the outcome of the next day.

MARCH 22. The London market remained unchanged, although some operators expected a slightly higher figure due to the Exchange being up about 80 points after the drastic decline of Wednesday but as there did not seem a great deal of support, even at these figures, the market remained idle with little business being transacted and little factory demand. Some dealers preferred to sit tight until a more definite trend of prices could be seen before operating in either direction. It was thought, in the trade, that on the last drastic decline a great many of the dealers had become frightened, selling nearby rubber so that when actual deliveries have to be made there may be a fair tightness for the nearby position, especially with the heavy consumption estimated for March.

MARCH 23. The trade expected a rather dull day and although prices came over

New York Quotations

Following are the New York open market rubber quotations for one year ago, one month ago and March 25, the current date

Plantation Hevea	March 26, 1928	February 23, 1929	March 25, 1929
Rubber latex (Hevea)..gal.	$1.50 @	$1.40 @	$1.40 @
CREPE			
First latex spot	.28 @	.26¼ @	.23½ @
March	.28 @	.26¼ @	.23½ @
April-June	.28½ @	.26½ @	.23¾ @
July-Sept.	.29 @	.27 @	.24 @
Oct.-Dec.	.29½ @	@	.24½ @
Off latex, spot	.27¾ @	.26 @	.22½ @
"B" Blanket, spot	.26 @	.24 @	.19¾ @
March	.26 @	.24 @	.19¾ @
April-June	.26½ @	.23½ @	.19½ @
July-Sept.	.26¼ @	.24½ @	.19¾ @
Oct.-Dec.	.27¼ @	@	.20 @
"C" Blanket, spot	.25½ @	.23½ @	.19 @
Brown No. 1	.25 @	.23½ @	.19¾ @.19½
Brown No. 2	.24½ @	.23¾ @	.19 @.19¼
Brown, roll	.22 @	.19 @	.14¾ @.15
Sheet			
Ribbed, smoked spot	.27⅝ @	.25⅜ @	.22½ @
March	.27⅝ @	.25½ @	.22½ @
April-June	.28 @	.25⅞ @	.22¾ @
July-Sept.	.28½ @	.26⅜ @	.23 @
Oct.-Dec.	.29 @	@	.23½ @
East Indian			
PONTIANAK			
Banjermasin	.09 @.10	.10½ @	.09 @.09½
Pressed block	.14¼ @.15	.16½ @	.15½ @
Sarawak	.10 @	@	.10½ @
South American			
PARAS			
Upriver, fine	.24¼ @	.26 @	.23 @.23½
Upriver, fine	*.32½ @.33½	*.31½ @	@
Upriver, coarse	.15¼ @	.15½ @	.13½ @.14
Upriver, coarse	*.27 @.28	*.22½ @	@
Islands, fine	.22 @	.22½ @	.18 @.18½
Islands, fine	*.31 @.32	*.31 @	@
Acre, Bolivian, fine	.24¼ @	.26¾ @	.23½ @.24
Acre, Bolivian, fine	*.33 @.34	*.32 @	@
Beni, Bolivian	.25¼ @	.27 @	.24 @.24½
Madeira, fine	.24¼ @	.26 @	.23 @

South American	March 26, 1928	February 23, 1929	March 25, 1929
PARAS—*Continued*			
Peruvian, fine	.22¾ @	.24 @	.22 @
Tapajos, fine	.22¾ @	.24 @	.22 @
CAUCHO			
Upper caucho ball	.19 @	.15½ @	.13½ @.14
Upper caucho ball	†.27 @	*.22½ @	@
Lower caucho ball	.18½ @	.15 @	.14 @
Manicobas			
Ceará negro heads	†.18 @	†.20 @	†.19 @
Ceará scrap	†.10 @	†.12 @	†.11 @
Manicoba, 30% guaranteed	†.20 @	†.22 @	†.21 @
Mangabiera, thin sheet	†.20 @	†.22 @	†.21 @
Centrals			
Central scrap	.19 @	.14½ @	.12 @.13
Central wet sheet	.17 @	@	@
Corintò scrap	.19 @	.14½ @	.12 @.13
Esmeralda sausage	.19 @	.14½ @	.12 @.13
Guayule			
Duro, washed and dried	.25 @	.21½ @	.20 @
Ampar	@	.23 @	.21¼ @
Gutta Percha			
Gutta Siak	.19½ @.20	.20 @	.19½ @.20
Gutta Soh	.37 @	.32 @	.31 @.32
Red Macassar	3.00 @3.10	2.75 @	2.25 @
Balata			
Block, Ciudad Bolivar	.49 @.42	.50 @	†.49 @
Colombia	.42 @	.47 @	†.47½ @
Manaos block	.43 @	.57 @	.57 @
Panama	.41 @	.54 @	@
Surinam sheet	.54 @.55	@	.52 @
Amber	.57 @.58	.54 @	.54 @
Chicle			
Honduras	‡.65 @	‡.68 @	‡.68 @
Yutacan, fine	‡.65 @	‡.68 @	‡.68 @

*Washed and dried crepe. Shipment from Brazil.
†Nominal. ‡Duty paid.

from London 1/16 to ⅛ easier, at 11¼ pence, the market was down on the opening bids about 20 to 30 points and seemed rather steady with very little going on. Then, as the short Saturday session on the Exchange continued, it was thought due to the weak stock market and fear of credit situation, distress selling appeared which carried prices on a further decline of 70 to 80 points.

Very little factory business was heard of on this further decline which carried prices down to the lowest for some time. Dealers remained idle not knowing which way to turn, and very little business was done.

MARCH 25. Practically no business was transacted as the factories are sitting by more than ever watching the continued decline in prices, until they can see some reason for the decline and also until the market shows some steadiness. Paras have been off slightly in sympathy with plantations and the southern shippers have not been following this decline as they have paid higher prices for their rubber and would rather hold than take a loss. Balatas are very quiet although firm with very little trading.

Factories were active buyers March 23, during the break and continued buying in a smaller scale March 25, but March 26 there were active buyers in the foreign markets. Although a litlte rubber was obtained, they did not secure the desired quantities with the result that eastern shippers only offered at high prices or withdrew altogether. It was also learned that those with several foreign accounts had no rubber to offer at all. It is thought, now, that after the violent break, rubber is in a stronger statistical position than formerly and there is more demand for rubber at this level than at the higher level of 27 cents. The market closed firm with buyers.

In summarizing the month of March it might be said that prices held very steady until the publication of the Rubber Association figures, which some authorities state was the most wonderful in the history of the industry, because the consumption was 41,494 tons, for the short working month of February. This is evidence that the industry is going ahead at full capacity and it is estimated that March consumption will be even higher.

Despite these high consumption figures, the market has been a little disappointing to those bullishly inclined, but due to the sharp break on March 20, others feel that this shake-out of long accounts and speculative holdings has placed the market in a much stronger position and offers opportunities for purchases of the forward months.

February Imports

Importations of all grades in January and February, 1929, were 116,843 tons, compared with 75,688 tons for the same period one year ago. Plantation arrivals for February, 1929, were 64,538 tons, compared with 29,445 tons one year ago.

Rubber Afloat to the United States

All figures in long tons.

Week Ended	British Malaya	Ceylon	Netherland East Indies	London and Liverpool	Total
Mar. 2..	10,200	1,510	3,744	55	15,509
Mar. 9..	8,281	1,974	1,974	9	12,238
Mar. 16.	7,370	572	1,977	9	9,928
Mar. 23..	8,757	754	1,673	...	11,184

RECLAIMED RUBBER

THE demand for reclaims, especially those of the highest qualities, has steadily increased in volume since the beginning of the year. The belief that consumption for this year will exceed that of last is probably well founded.

Reclaiming plants are operating on 24-hour schedules to meet their contract deliveries. They will be unable to accumulate heavy stocks until midsummer, if it all. The higher types of reclaim feel the benefit of the advance in crude rubber more than the lower grades although demand for the latter is steadily improving.

No. 1 floating reclaims of excellent plasticity and transparency have been developed. These are particularly well adapted for tubing work, insulation and in stocks of light colors for special mold work.

The fact that every grade of reclaim in the entire list quoted below is firm at the prices quoted a month ago is evidence of the strong demand and the incidental effect of fair prices for crude rubber.

The following standard grades of reclaim are listed and quoted unchanged from last month:

New York Quotations

March 25, 1929

High Tensile	Spec. Grav.	Price	Per Pound
Super-reclaim, black	1.20	$0.13	@$0.13½
red	1.20	.13	@ .13½
Auto Tire			
Black	1.21	$0.08	@$0.08½
Black selected tires	1.18	.08½	@ .09
Dark gray	1.35	.10	@ .10½
Light gray	1.38	.12	@ .12½
White	1.40	.13	@ .13½
Shoe			
Unwashed	1.60	.07¼	@ .07½
Washed	1.50	.10	@ .10¼
Tube			
No. 1	1.00	.14	@ .14½
No. 2	1.10	.11	@ .11½
Miscellaneous			
Red	1.35	.12½	@ .13
Truck tire, heavy gravity	1.55	.07	@ .07¼
Truck tire, light gravity	1.40	.07½	@ .07¾
Mechanical blends	1.60	.07	@ .07½

RUBBER SCRAP

DURING the past month rubber scrap became easier in tone owing to spring collections although consumption by reclaimers was high. The only grades quoted lower than last month are mixed auto tires with beads and mixed auto tires beadless.

The outlook for improved spring business is good owing to the influence of crude rubber prices on reclaim demand and the strong favor with which manufacturers regard the improved technical qualities possessed by the better grades of reclaim.

Boots and shoes continue in steady demand as also do tennis shoes and soles. These grades are unchanged in price.

Pneumatic tires, with and without beads, are in good demand at steady prices. Advances are noted in mixed auto peelings of $2 per ton. Solid truck tires are up $1 per ton and in good supply.

No. 1 inner tubes have advanced only ¼ of a cent. The same is true of red inner tubes. No. 2 tubes and mixed tubes are unchanged. All grades of tubes are in very good demand.

The standard grades are listed and quoted as follows:

CONSUMERS' BUYING PRICES

Carload Lots

March 25, 1929

Boots and Shoes	Prices
Boots and shoes, black....lb.	$0.01⅝@$0.01¾
Untrimmed arctics.....lb.	.01 @ .01⅛
Tennis shoes and soles...lb.	.01 @
Hard Rubber	Prices
No. 1 hard rubber.....lt	$0.08 @$0.08½
Mechanicals	
Mixed black scrap.....lb.	.00½@ .00⅝
Hose, air brake.....ton	32.50 @35.00
regular soft .....lb.	17.50 @20.00
No. 1 red .....lb.	.02 @ .02¼
No. 2 red .....lb.	.01 @ .01⅝
White druggists' sundries.lb.	.02 @ .02⅛
Mechanical .....lb.	.01⅛@ .01⅜
Tires	
Pneumatic Standard—	
Mixed auto tires with beads .....ton	27.00 @28.00
Beadless .....ton	35.00 @36.00
White auto tires with beads .....ton	40.00 @42.00
Beadless .....ton	50.00 @57.50
Mixed auto peeling....ton	42.00 @44.00
Solid—	
Mixed motor truck, clean .....ton	25.00 @26.00
Inner Tubes	
No. 1, floating.....lb	.07½@ .07¾
No. 2, compounded.....lb.	.05 @ .05¼
Red .....lb.	.05¾@ .05⅞
Mixed tubes .....lb.	.05 @ .05⅛

Compounding Ingredients

RUBBER goods manufacturing in all lines is very active except in footwear which has had three poor years in succession because of mild and open winters. Tire production continues at full capacity at the larger plants. Competitive conditions are said to be gradually growing more difficult for the small tire producers. The demand for mechanical rubber goods is showing the usual seasonal spring increase. Trade in weatherproofed clothing and calendered and spread sheet goods has reached a good volume. Wire and cable insulation is also active. Building activity reacts directly to increase, notably the demand for code wire.

Manufacturing conditions are thus increasingly favorable to the demand for compounding ingredients.

ACCELERATORS. The well-known types of accelerators are in good demand, more especially those of low temperature activity.

ANTIOXIDANTS. These are meeting with steadily increasing favor and are offered in variety, admitting of choice as to their special adaptability.

BENZOL. The consumption is broad and active. Quotations are unchanged and firm.

CARBON BLACK. All prices are unchanged and the product is moving steadily into consumption in the rubber and other trades.

CLAY. All brands of staple reenforcing clay for rubber work is in steady demand. As a reenforcing pigment for rubber, clay holds second place only to carbon black.

DEGRAS. New business in degras is reported quiet. This is well suited as a rubber softener and the demand is steady.

LITHARGE. Commercial powdered litharge is higher at 10¼ cents a pound. Stock in kegs also advanced ¼-cent to 13¾ cents a pound.

LITHOPONE. This material has advanced 1¼ cents to 10¾ cents a pound. Trade movement is reported good.

MINERAL RUBBER. Production is at capacity to meet the steadily increasing demand of this standard ingredient. Prices are firm.

SOLVENT NAPHTHA. Movement is routine and demand is well sustained.

V. M. P. NAPHTHA. There has been no change in price since the reduction to 10 cents a gallon in the New York territory. The market continues easy.

STEARIC ACID. The demand for stearic acid by the rubber trade has increased. It now represents about 30 per cent of the current output.

ZINC OXIDE. The advance in the price for slab zinc has not affected that for oxide. The trade movement is seasonally active.

New York Quotations

March 25, 1929

Accelerators, Inorganic

Lead, carbonate	lb.	$0.08¾	@
Lead, red	lb.	.10¾	@
sublimed white	lb.	.08¼	@
sublimed blue	lb.	.08¼	@
super-sublimed white lead	lb.	.08½	@
Lime, R. M. hydrated	ton	20.00	@
Litharge	lb.	.09¾	@
Magnesia, calcined heavy	ton	80.00	@90.00
Magnesia carbonate	lb.	.06	@ .07
Orange mineral A.A.A.	lb.	.12¾	@

Accelerators, Organic

A-7	lb.	.55	@ .65
A-11	lb.	.62	@ .75
A-16	lb.	.57	@ .65
A-19	lb.	.58	@ .75
A-20	lb.	.64	@ .80
A-32	lb.	.78	@ .95
Aero X	lb.	.60	@ .65
Albasan	lb.	.70	@ .75
Aldehyde ammonia	lb.	.65	@ .70
B. B.	lb.		@
Captax	lb.		@
Crylene, hard form	lb.		@
Paste	lb.		@
D. B. A.	lb.	2.00	@
Di-ortho-tolylguanidine	lb.		@
D. P. G.	lb.	.30	@ .35
Ethylidine aniline	lb.		@
Formaldehyde aniline	lb.		@
Grasselerator 102	lb.		@
552	lb.		@
808	lb.		@
833	lb.		@
Heptene	lb.	.40	@
Lead oleate, No. 999	lb.	.16	@
Witco	lb.	.15	@
Lithex	lb.	.18	@ .20
Methylene dianiline	lb.		@
Monex	lb.	3.25	@
Plastone	lb.		@
R-2	lb.	2.00	@ 2.50
R. & H. 40	lb.		@
50	lb.		@
Safex	lb.	1.20	@
Sunproof	lb.	.50	@
Super-sulphur, No. 1	lb.		@
No. 2	lb.		@
Tensilac No. 39	lb.	.50	@ .52½
No. 41	lb.	.50	@ .52½
Thermlo F	lb.	.50	@ .55
Thiocarbanilid	lb.	.25½	@ .26½
Trimene	lb.	.75	@
base	lb.	1.20	@
Tuads	lb.		@
ZBX	lb.	2.50	@
Z-88	lb.	.50	@ .60
Zimate	lb.		@

Acids

Acetic 28% (bbls.)	100 lbs.	3.88	@ 4.13
glacial (carboys)	100 lbs.	14.18	@14.43
Sulphuric, 66°	100 lbs.	1.60	@

Alkalies

Caustic soda, 76% solid,	100 lbs.	2.95	@

Anti-Oxidants

Age-Rite, powder	lb.		@
resin	lb.		@
white	lb.		@

Anti-Oxidants—*(Continued)*

Antox	lb.		@
Grasselerager A	lb.		@
Oxynone	lb.	$0.68	@ .90
Resistox	lb.	.54	@ .65
Stabilite	lb.	.64	@
V. G. B.	lb.		@

Colors

BLACK

Bone	lb.	.07	@ .09
Carbon (see compounding ingredients)			
Drop	lb.	.05½	@ .15
Lampblack (commercial)	lb.	.09	@

BLUE

Akco blue	lb.	1.80	@
Huber Brilliant	lb.	4.20	@ 4.70
Prussian	lb.	.35	@ .40
Ultramarine	lb.	.06	@ .30

BROWN

Huber Mocha	lb.	1.60	@ 2.10
Sienna, Italian, raw	lb.	.05½	@ .12½

GREEN

Akco green	lb.	2.60	@
Chrome, light	lb.	.27	@ .31
medium	lb.	.28	@ .31
Huber Brilliant	lb.	4.35	@
Oxide of chromium	lb.	.31	@ .38

ORANGE

Huber Persian	lb.	.50	@ 1.00

RED

Akco red	lb.	2.75	@
Antimony			
Crimson, R. M. P. No. 3	lb.	.48	@
Sulphur, free	lb.	.52	@ .60
Vermilion, No. 5	lb.		@
No. 15	lb.		@
Golden, No. 40	lb.		@
No. 60	lb.		@
15/17%	lb.	.21	@ .22
7-A	lb.	.35	@
Z-2	lb.	.22	@
Aristi	lb.	2.75	@
Huber Brilliant	lb.	1.35	@ 1.85
Iron Oxides			
bright pure domestic	lb.	.12	@
bright pure English	lb.	.12	@ .14
bright reduced English	lb.	.10	@
bright reduced domestic	lb.	.10	@
Indian (maroon), pure domestic	lb.	.11	@
Indian (maroon), pure English	lb.	.10½	@ .11
Indian (maroon), reduced English	lb.	.09½	@
Indian (maroon), reduced domestic	lb.	.08	@
Oximony	lb.	.13¼	@
Spanish red oxide	lb.	.04	@
Sunburnt red	lb.	.14¼	@
Venetian reds	lb.	.02	@ .06
Vermilion, Eng. quick-silver	lb.	1.95	@

Colors—*(Continued)*

WHITE

Lithopone	lb.	$0.05½	@
Albalith	lb.		@
Azolith	lb.	.05¼	@ .05¾
Grasselli	lb.	.05¼	@ .05¾
Sterling	lb.		@
Vanolith	lb.	.05¼	@
Titanox	lb.	.09½	@ .10
Zinc Oxide			
AAA (lead free)	lb.	.07	@
Azo (factory):			
ZZZ (lead free)	lb.	.06½	@ .07
ZZ (leaded)	lb.	.06¼	@ .06¾
Z (8% leaded)	lb.	.06¼	@ .06¾
Green seal	lb.		@
Kadox	lb.		@
Red seal	lb.		@
Special	lb.		@
White seal	lb.		@
XX green label	lb.		@
XX red label	lb.		@

YELLOW

Akco yellow	lb.	1.45	@
Cadmium sulphide	lb.	.95	@ 1.75
Chrome	lb.	.16½	@ .17
Grasselli cadmium	lb.		@
Huber canary	lb.	3.30	@ 3.80
Ochre, domestic	lb.	.01¾	@ .02½
Ochre, French	lb.	.02¾	@ .03½
Oxide, pure	lb.	.08½	@
Zinc, C. P., imported	lb.	.23	@

Compounding Ingredients

Aluminum flake (sacks, c.l.)	ton	21.85	@
(sacks l.c.l.)	ton	24.50	@
Ammonium carb. pwd.	lb.	.13	@ .17
lump	lb.	.12	@ .16
Asbestine	ton	13.40	@14.50
Barium, carbonate	ton	58.00	@60.00
Baryta white (f.o.b. St. Louis, bbls.)	ton	23.00	@
Baryta white (f. o. b. St. Louis, (paper bags)	ton	22.20	@
Barytes, imported	ton	27.00	@34.00
off color	ton	12.00	@20.00
Foam "A" (f. o. b. St. Louis, bbls.)	ton	23.00	@
Foam "A" (f. o. b. St. Louis, bags)	ton	23.00	@
Basofor	lb.		@
Blanc fixe, dry	lb.	.04½	@
pulp	ton	42.50	@45.00
Carbon Black			
Aerfloted arrow	lb.	.08½	@ .12
Compressed	lb.	.08½	@ .12½
Fumonex	lb.	.06	@ .09
Micronex	lb.	.09	@ .13
Uncompressed	lb.	.08	@ .12
Velvetex	lb.	.04½	@ .06
Carrara filler	ton		@
Chalk	ton	12.00	@
Clay, Blue Ridge, dark	ton		@
Blue Ridge, light	ton		@
China	lb.	.03	@ .03½
Dixie	ton		@
Langford	ton		@
Mineral flour (Florida)	ton		@
Perfection	ton	30.00	@
Suprex	ton	10.00	@22.00
Tensulite	ton	25.00	@

Compounding Ingredients (Continued)

Cotton flock, black	lb.	$0.13	@
light-colored	lb.	.10	@ .12
white	lb.	.12	@ .30
Glue, high grade	lb.	.25	@ .30
low grade	lb.	.22	@ .26
Infusorial earth	ton	35.00	@
Mica, amber (fact'y)	ton	80.00	@
Neomerpin, S. A. conc.	lb.	.60	@
Pumice stone, powd.	lb.	.02½	@ .04
Rottenstone (bbls.)	lb.	.02½	@ .04½
Shellac, fine orange	lb.	.70	@
Soapbark	lb.	.15½	@ .16
Soapstone	ton	15.00	@22.00
Talc, domestic	ton	25.00	@
French	ton	18.00	@22.00
Pyrax A	ton		@
B	ton		@
Thermatomic carbon	lb.		@
Whiting			
Domestic	100 lbs.	1.00	@
English, cliffstone	100 lbs.	1.50	@
Quaker	ton		@
Slate flour, gray (fact'y)	ton	7.00	@
Snow white	ton		@
Sussex	ton		@
Vancolloid	ton	27.00	@
Vansulite	ton	26.00	@
Westminster Brand	100 lbs.		@
Witco (l. c. l.) (f. o. b. New York)	ton	20.00	@
Whiting, imp. chalk	100 lbs.	.90	@ 1.25
Paris White	100 lbs.	1.50	@

Factice—See Rubber Substitutes

Mineral Rubber

Fluxrite (solid)	lb.	.05	@ .06
Genasco (fact'y)	ton	50.00	@52.00
Gilsonite (fact'y)	ton	37.14	@39.65
Granulated M. R.	ton		@
Hydrocarbon, hard	ton		@
Hydrocarbon, soft	ton		@
Ohmlac Kapak, M. R.	ton	40.00	@90.00
M-4	ton	175.00	@
Paradura (fact'y)	ton	62.50	@65.00
Pioneer, M. R., solid (fact'y)	ton	40.00	@42.00
M. R. granulated	ton	50.00	@52.00
Robertson, M. R., solid (fact'y)	ton	34.00	@80.00
M. R. gran. (fact'y)	ton	38.00	@80.00
Vansul Puro	ton	27.00	@

New York Quotations

March 25, 1929

Oils

Kerosene	gal.	$0.15	@
Mineral	gal.	.20	@
Poppy seed oil	gal.	1.70	@ 1.85
Rapeseed	gal.	.84	@
Red oil, distilled	lb.	.11⅛	@ .11⅜
Rubber process	gal.	.25	@
Spindle	gal.	.30	@

Rubber Substitutes or Factice

Black	lb.	.08	@ .14
Brown	lb.	.08	@ .15
White	lb.	.09	@ .16½

Softeners

Burgundy pitch	100 lbs.	6.00	@
Atlas	100 lbs.	6.50	@
Corn oil	lb.	.10½	@
Cottonseed oil	lb.	.11¼	@
Cycline oil	gal.	.28	@ .35
Degras	lb.	.03⅝	@ .04¾
Fluxrite (fluid)	lb.	.05	@ .06
Moldrite	lb.	.06½	@ .07½
Palm oil (Lagos)	lb.	.09⅞	@
Palm oil (Niger)	lb.	.08¾	@
Palm oil (Witco)	lb.	.11	@
Para-flux	gal.	.17	@
Petrolatum, snow white	lb.	.08½	@ .08¾
Pigmentar	lb.	.038	@ .0446
Pine oil, steam distilled	gal.	.63	@
Pine tar (retort)	gal.	.28	@
Rosin K	bbl.	9.15	@
Rosin oil, compounded	gal.	.26	@
No. 3, deodorized	gal.	.60	@
No. 556, deodorized	gal.	.51	@
Rubite	lb.	.10½	@
Rubtack	lb.	.11	@
Stearex	lb.	.15	@ .20
Stearic acid, double pressed	lb.	.16½	@ .17
Tackol	lb.	.09	@ .15
Tasco W-S No. 1	lb.		@
A	lb.		@
Vansulol	lb.	.12½	@
Vantar (Pine Tar)	gal.	.35	@
Waxene	lb.	.30	@ .40
Woburn oil	lb.	.05½	@ .06

Solvents

Benzol (90%, 7.21 lbs. gal.)	gal.	$0.28	@
Carbon bisulphide (99.9%, 10.81 lbs. gal.) (drums)	lb.	.05½	@ .08
tetrachloride (99.7%, 13.28 lbs. (gal.) (drums)	lb.	.06¼	@ .10
Cyclohexanone	lb.		@
Dip-Sol	gal.	.13	@
Dryolene	gal.	.11	@
Gasoline			
No. 303			
Tankcars	gal.	.15	@
Drums, c. l.	gal.	.31	@
Drums, l. c. l.	gal.	.36	@
Hexalin	lb.	.60	@
acetate	lb.	.65	@
Rub-Sol	gal.	.10½	@
Solvent naphtha	gal.	.35	@
Stod-Sol	gal.	.10½	@
Sweet rubber cement naphtha	gal.	.16½	@
Turpentine, Venice	lb.	.20	@
steam distilled	gal.	.53	@ .55

Vulcanizing Ingredients

Sulphur			
Velvet flour (240 lb. bbls.)	100 lbs.	2.95	@ 3.50
(150 lb. bags)	100 lbs.	2.60	@ 3.15
Soft rubber (c.l.)	100 lbs.	2.40	@ 2.75
(l.c.l.)	100 lbs.		@
Superfine commercial flour (210 lb. bbls.)	100 lbs.	2.55	@ 3.10
(100 lb. bags)	100 lbs.	2.40	@ 2.80
Tire brand, superfine,	100 lbs.	1.90	@ 2.25
Tube brand, velvet	100 lbs.	2.40	@ 2.75
Sulphur chloride	lb.	.05	@ .07
Vandex (selenium) (See also Colors—Antimony)	lb.		@

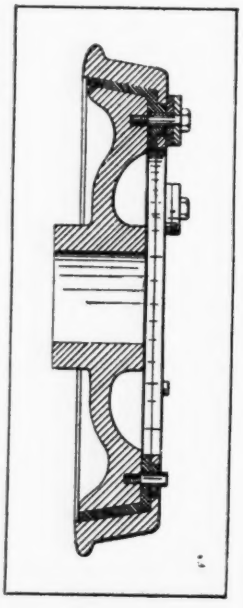
Waxes

Beeswax, white, com.	lb.	.55	@
carnauba	lb.	.33	@
ceresine, white	lb.	.12½	@
montan	lb.	.07½	@
ozokerite, black	lb.	.28	@
green	lb.	.28	@
Paraffin			
122/124 white crude scale	lb.	.05	@
124/126 white crude scale	lb.	.05	@
120/122 fully refined	lb.		@
125/127 fully refined,	lb.		@

Rubber Cushioned Car Wheel[1]

A NOVEL application of rubber as a shock insulator for railway car wheels is here illustrated. The car wheel body of cast metal is provided with a conical or tapered outer periphery. The flanged metal tire is provided with an under surface parallel to the conical outer face of the wheel body. The rubber element is interposed between the outer steel tire and the wheel body as a cushioning layer or band which will deaden and absorb the shocks incident to use, thus contributing to easier riding and less noise in operation of the car. These results are appreciated by sleeping car passengers.

When the wheel and tire are assembled a tight fitting mounting is provided and the parts are securely fastened together by bolts as pictured in the radial cross section shown. It will be noted that all metal to metal contacts between wheel body and the tire are avoided. In this manner the greatest cushioning properties are obtained and wear and disintegration of the parts are avoided. This invention provides for economy in rolling stock and comfort to passengers.



Shock Absorbing Car Wheel

[1]U. S. patent No. 1,693,576.

British Malaya

RUBBER EXPORTS

An official cable from Singapore to the Malay States Information Agency, Malaya House, 57 Charing Cross, London, S. W. E, England, states that the amount of rubber exported from British Malaya in February last totaled 47,926 tons, as compared with 52,546 tons in January, and 28,813 tons in the corresponding period of 1928. The amount of rubber imported was 12,103 tons, of which 8,999 tons were declared as wet rubber. The following are comparative statistics.

	1928		1929	
	Gross Exports Tons	Foreign Imports Tons	Gross Exports Tons	Foreign Imports Tons
January	27,731	16,618	52,546	13,415
February	28,813	12,911	47,926	12,103
Totals	56,544	29,529	100,472	25,518

The above figures represent the totals compiled from declarations received up to the last day of the month for export from and import to all ports of British Malaya, and not necessarily the actual quantity shipped or landed during that month.

DISTRIBUTION

The following is a comparative return of distribution of shipments during the months of January and February, 1929:

	Jan., 1929 Tons	Feb., 1929 Tons
United Kingdom	5,294	6,450
United States	38,273	32,827
Continent of Europe	5,552	5,516
British Possessions	1,029	852
Japan	2,331	2,172
Other foreign countries	67	109
Totals	52,546	47,926

Cotton and Fabrics

AMERICAN COTTON. The price of spot middling cotton on March 1 was 20.70 cents compared with 20.00 cents on February 1. From this level the price soon advanced above 21.00 cents reaching 21.65 cents on March 8 and 9. This was the highest price for spot since July, 1928. Cotton held above 21.00 cents continuously until the close of the month. This strength was due to the depletion of last year's crop and uncertainty of the size of that for the present year.

Publication of the Census report on the ginnings of the 1928 crop shows it to have been 77,000 bales larger than the final crop government estimate. Concerning the present outlook for the 1929 crop the late start is being still further delayed by rains and overflows in the eastern and central belts.

The schedule of government cotton crop reports during 1929 has been announced. Seven estimates are planned as follows: May 17; July 8; Aug. 8; Sept. 9; Oct. 8; Nov. 8; Dec. 9.

A duty on cotton of 1 1/16-inch or longer is opposed by the tire manufacturers in a brief filed by the Rubber Association of America with the House Committee on Ways and Means in connection with the proposed revision of duties in Schedule 15 (free list), Tariff Act of 1922.

EGYPTIAN COTTON. During the past month all staple cottons have advanced. Whereas two months ago there appeared to be a large excess in the supply of the longer cottons there is now a scarcity in some lengths, particularly in the better grades. It is quite evident that the low prices last autumn stimulated consumption and allowed American merchants to ship full on all contracts thus helping to reduce materially the supplies of staples.

Report comes from Egypt of a slight increase in acreage and a large increase in that devoted to such new growths as Nahda. On the other hand, owing to unsatisfactory yield, a reduction in Sakel acreage is indicated.

PIMA COTTON. Present indications in Arizona are that there will be considerable increase in Pima acreage and a crop as large as 35,000 bales is now considered possible. The exceedingly high prices which have been obtained for Pima during the past two years have undoubtedly attracted the attention of the farmers in the Salt River Valley and in California.

Cotton Fabric

DUCKS, DRILLS AND OSNABURGS. In these goods market prices are firm, trading is brisk and there is a good demand for specialty fabrics. Indications are favorable for the continuance of good business throughout the spring on specialties.

SHEETINGS. The market on sheetings used in the rubber trade was quiet the past month and prices remain firm.

TIRE FABRICS. The demand for tire fabrics for March was rather light. Prices held firm and unchanged. Early in the month there were small sales of carded peeler and inquiries were fair for later deliveries. Fabric mills were unwilling to make commitments far ahead. During the first half of the month only moderate poundages were sold. The smaller fabric mills were reported sold up till June.

About the middle of the month some 500,000 pound orders were placed for carded peeler cords. Chafer fabric was in some demand. Rubber Association report of the consumption of tire fabrics in January showed it to have run in excess of the average monthly consumption for 1928. Fabric business for the third week of the month indicated a very good consuming demand.

New York Quotations

March 25, 1929

Drills

38-inch 2.00-yard	*yard*	$0.18 @
40-inch 3.47-yard		.10½ @
50-inch 1.52-yard		.24⅜ @
52-inch 1.90-yard		.19½ @
52-inch 2.20-yard		.17¼ @
59-inch 1.85-yard		.21⅝ @

Ducks

38-inch 2.00-yard D. F.	*yard*	.18½ @
40-inch 1.45-yard S. F.		.25⅛ @
72-inch 1.05-yard D. F.		.38 @
72-inch 16.66-ounce		.41⅛ @
72-inch 17.21-ounce		.42½ @

MECHANICAL

Hose and belting	*pound*	@
Specials		@

TENNIS

52-inch 1.35-yard	*yard*	.28 @

Hollands

R.T.5—30-inch	*yard*	.16 @
R.T.7—36-inch		.18 @
R.T.8—40-inch		.20 @

RED SEAL

36-inch		.15½ @
40-inch		.16½ @
50-inch		.25 @

GOLD SEAL

40-inch, No. 72		.20¾ @
40-inch, No. 80		.22 @

Osnaburgs

40-inch 2.35-yard	*yard*	$0.15½ @
40-inch 2.48-yard		.14¾ @
40-inch 3.00-yard		.12⅛ @
40-inch 10-oz. part waste	*lb.*	.08¾ @
40-inch 7-oz. part waste	*lb.*	.13 @
37-inch 2.42-yard		.14⅞ @

Raincoat Fabrics

COTTON

Bombazine 64 x 60	*yard*	.10½ @
Bombazine 60 x 48		.09½ @
Plaids 60 x 48		.12 @
Plaids 48 x 48		.11 @
Surface prints 64 x 60		.13½ @
Surface prints 60 x 48		.12½ @
Print cloth, 38½-in., 60 x 48		.06¾ @
Print cloth, 38½ in., 64 x 60.		.07½ @

Sheetings, 40-inch

48 x 48, 2.50-yard	*yard*	.13 @
48 x 48, 2.85-yard		.11⅜ @ .11½
64 x 68, 3.15-yard		.11⅞ @
56 x 60, 3.60-yard		.09¾ @ .09⅞
44 x 48, 3.75-yard		.08¾ @ .08⅞

Sheetings, 36-inch

48 x 48, 5.00-yard	*yard*	.07 @
40 x 44, 6.15-yard		.05¾ @ .05⅞

Tire Fabrics

SQUARE WOVEN 17¼-ounce

Peeler, karded	*pound*	$0.49 @

BUILDER 23/11

Peeler, karded	*pound*	.49 @

BUILDER 10/5

Peeler, karded	*pound*	.46 @

CORD 23/5/3

Peeler, karded, 1 1/16-in.	*pound*	.49 @

CORD 23/4/3

Peeler, karded	*pound*	.51 @

CORD 23/3/3

Peeler, karded	*pound*	.53 @

CORD 15/3/3

Peeler, karded	*pound*	.47 @

CORD 13/3/3

Peeler, karded	*pound*	.46 @

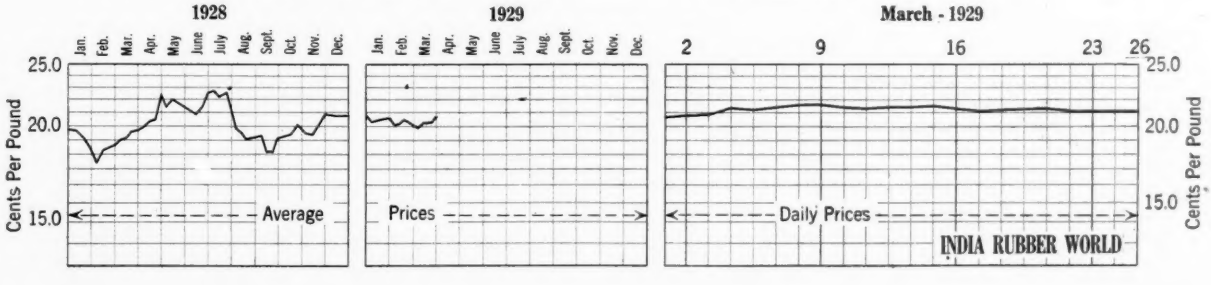
LENO BREAKER

8-oz. Peeler, karded	*pound*	.49 @
10-oz. Peeler, karded		.49 @

CHAFER

9.5-oz. Peeler, karded	*pound*	.49 @
12-oz. Peeler, karded		.48 @
14-oz. Peeler, karded		.49 @

Ratio Graph of New York Daily Prices of Spot Middling Upland Cotton



Rubber Questionnaire

Calendar Year 1928*

Reclaimed Rubber	Long Tons: Inventory at End of Year	Production	Shipments	Consumption
Reclaimers solely	5,785	84,073	83,934	3
Manufacturers who also reclaim	9,439	123,796	45,136	87,020
Other manufacturers	6,500	.....	.....	69,409
Totals	21,724	207,869	129,070	156,432

Scrap Rubber	Long Tons: Inventory	Consumption	Due on Contract
Reclaimers solely	42,153	151,462	65,367
Manufacturers who also reclaim	25,690	110,859	63,975
Other manufacturers	1,026	.....	.....
Totals	68,869	262,321	129,342

Tons of Rubber Consumed in Rubber Products and Total Sales Value of Shipments

Products — Tires and Tire Sundries:	Crude Rubber Long Tons	Total Sales Value of Shipments of Manufactured Rubber Products
Automobile and motor truck pneumatic casings	271,487	$622,557,000
Automobile and motor truck pneumatic tubes	56,403	94,854,000
Motorcycle tires (casings and tubes)	412	1,834,000
Bicycle tires (single tubes, casings and tubes)	966	2,845,000
Aeroplane casings and tubes	116	411,000
Solid and cushion tires	12,220	24,694,000
All other solid tires	634	2,602,000
Tire sundries and repair materials	6,101	21,269,000
Totals	348,339	$771,066,000

Products — Other Rubber Products:	Crude Rubber Long Tons	Total Sales Value of Shipments of Manufactured Rubber Products
Mechanical rubber goods	17,894	$102,258,000
Boots and shoes	16,894	93,875,000
Insulated wire and insulating compounds	3,444	34,432,000
Druggists' sundries, medical, surgical rubber goods	1,577	8,492,000
Stationers' rubber goods	1,271	2,746,000
Bathing apparel	627	2,347,000
Rubber clothing	1,248	8,438,000
Automobile fabrics	961	9,110,000
Other rubberized fabrics	2,237	9,695,000
Hard rubber goods	1,110	7,345,000
Heels and soles	5,591	23,653,000
Rubber flooring	1,062	4,707,000
Sporting goods, toys and novelties	1,380	7,582,000
Miscellaneous, not included in any of the above items	3,214	14,044,000
Totals	58,510	$328,724,000
Grand totals—all products	406,849	$1,099,790,000

Inventory of Rubber in the United States and Afloat

On Hand	Long Tons: Plantation	Para	All Other	Totals
Manufacturers	45,906	2,054	1,342	49,302
Importers and dealers	13,010	780	779	14,569
Totals on hand	58,916	2,834	2,121	63,871
Afloat				
Manufacturers	14,626	....	....	14,626
Importers and dealers	55,619	422	5	56,046
Totals afloat	70,245	422	5	70,672

*Number of rubber manufacturers that reported data was 159; crude rubber importers and dealers, 46; reclaimers (solely), 7; total daily average number of employes on basis of third week of each quarter, was 160,155.

It is estimated that the reported grand total crude rubber consumption and the grand total sales value figures to be approximately 92 per cent; the grand total crude rubber inventory and afloat figures 95 per cent; the reclaimed rubber production 93 per cent, reclaimed consumption 73 per cent and reclaimed inventory 78 per cent of the total for the entire industry. *Compiled from Rubber Association statistics.*

Rubber Statistics, Calendar Year 1928

The Rubber Association of America, Inc., 250 West 57th St., New York, N. Y., in its Statistical Bulletin No. 100 gives estimated figures covering certain operations in the rubber industry in the United States during the calendar year 1928.

The amount of crude rubber consumed in the manufacture of all rubber products during 1928 was 442,227 long tons, and of this 378,629 long tons were consumed in the manufacture of tires and tire sundries including bicycle and airplane tires. The stocks of crude rubber on hand as of December 31, 1928, totaled 67,232 long tons; while the amount of crude rubber afloat for United States ports as of December 31, 1928, totaled 74,391 long tons.

The estimated total sales value of shipments of all rubber products manufactured in the United States amounted to $1,195,423,900 of which $835,115,217 was the total sales of shipments of tires and tire sundries including bicycle and airplane tires. The total production of reclaimed rubber was estimated at 223,515 long tons of which 214,290 long tons were consumed.

Dominion of Canada Statistics

Imports of Crude and Manufactured Rubber

Unmanufactured	December, 1928: Pounds	Value	Nine Months Ended December, 1928: Pounds	Value
Rubber, gutta percha, etc.	5,865,337	$1,055,386	51,657,982	$11,779,413
Rubber recovered	1,278,500	87,872	12,440,500	884,069
Rubber and gutta percha scrap	459,700	15,680	5,075,800	202,858
Balata	7,138	2,936	10,546	4,555
Rubber substitutes	13,700	2,205	735,000	122,681
Totals	7,624,375	$1,164,079	69,919,828	$12,993,576
Partly Manufactured				
Hard rubber sheets and rods	6,488	$3,777	40,751	$27,088
Hard rubber tubes	.....	1,909	.....	11,811
Rubber thread not covered	27,159	27,873	166,877	181,255
Totals	33,647	$33,559	207,628	$220,154
Manufactured				
Belting	.....	$8,105	.....	$128,065
Hose	.....	11,289	.....	174,105
Packing	.....	5,720	.....	46,253
Boots and shoes, *pairs*	30,089	34,229	160,268	192,047
Clothing, including waterproofed	.....	28,938	.....	419,048
Gloves	.....	2,862	.....	14,424
Hot water bottles	.....	1,591	.....	26,344
Tires, solid, *number*	36	6,107	636	34,320
Tires, pneumatic, *number*	4,910	16,079	32,184	194,158
Tires, tubes, *number*	117	613	20,601	29,739
Mats and matting	.....	15,294	.....	100,042
Cement	.....	2,391	.....	53,068
Golf balls, *dozen*	441	1,593	24,712	99,135
Heels rubber, *pairs*	93,690	3,952	1,129,816	65,742
Other rubber manufactures	.....	100,389	.....	1,108,335
Totals	.....	$239,152	.....	$2,684,825
Totals, rubber imports	.....	$1,436,790	.....	$15,898,555

Exports of Domestic and Foreign Rubber Goods

Unmanufactured	Produce of Canada Value	Re-exports of Foreign Goods Value	Produce of Canada Value	Re-exports of Foreign Goods Value
Waste rubber	$20,164	.....	$185,020	.....
Totals	$20,164	.....	$185,020	.....
Manufactured				
Belting	$35,308	.....	$365,122	.....
Canvas shoes with rubber soles	325,596	.....	3,861,561	.....
Boots and shoes	281,442	.....	2,805,153	.....
Clothing, including waterproofed	1,179	.....	25,299	.....
Hose	18,802	.....	197,343	.....
Tires, casings	1,403,631	.....	11,931,348	.....
Inner tubes	174,605	.....	1,811,599	.....
Solid	12,673	.....	251,915	.....
Other rubber manufactures	141,514	$26,791	1,003,460	$68,235
Totals	$2,394,750	$26,791	$22,252,800	$68,235
Totals, rubber exports	$2,414,914	$26,791	$22,437,820	$68,235

London Stocks, January, 1929

	Landed for Jan. Tons	Delivered for Jan. Tons	Stocked January 31: 1929 Tons	1928 Tons	1927 Tons
London					
Plantation	11,077	5,708	25,069	66,378	54,785
Other grades	.....	2	75	95	127
Liverpool					
Plantation	†1,491	†504	†3,775	†2,136	†2,071
Total tons, London and Liverpool	12,568	6,214	28,919	68,609	56,983

†Official returns from the seven recognized public warehouses.

Low and High New York Spot Prices

Plantations	1929*	March 1928	1927
First latex crepe	$0.22¾ @ $0.26¼	$0.24¼ @ $0.29¼	$0.40 @ $0.42¼
Smoked sheet, ribbed	.22 @ .26	.24 @ .29⅛	.39½ @ .42¼
Paras			
Upriver, fine	.22½ @ .26¼	.21¾ @ .25¼	.32 @ .35
Upriver, coarse	.13 @ .16¼	.16¾ @ .21	.24½ @ .27¼
Islands, fine	.20½ @ .25	....@....	.28½ @ .31¼

*Figured to March 23, 1929.

United States Statistics

IMPORTS OF CRUDE AND MANUFACTURED RUBBER

	December, 1928		Twelve Months Ended December, 1928	
	Pounds	Value	Pounds	Value
UNMANUFACTURED—*Free*				
Crude rubber	97,466,001	$17,580,966	*978,107,393	*$244,854,973
Liquid latex	17,525	2,972	.....	.....
Balata	186,082	58,311	1,638,213	430,855
Jelutong or Pontianak	1,168,885	156,154	16,917,039	2,540,059
Gutta percha	324,659	59,911	3,578,442	777,123
Guayule	.....	.....	6,891,719	1,755,685
Rubber scrap	1,284,860	26,048	20,399,951	648,540
Totals	100,448,012	$17,884,362	1,027,532,757	$251,007,235
Chicle *dutiable*	1,170,906	$594,129	12,435,440	$6,295,673
MANUFACTURED—*Dutiable*				
Rubber belting	46,776	$28,487	531,272	$301,570
Rubber tires	42	818	4,469	70,256
Other manufactures of rubber	.....	142,534	.....	1,641,181
Totals	46,818	$171,839	535,741	$2,013,007

EXPORTS OF FOREIGN MERCHANDISE

RUBBER MANUFACTURES				
Crude rubber	6,133,921	$1,165,743	72,035,968	$18,128,361
Balata	62,680	19,380	345,995	121,953
Gutta percha, rubber substitutes and scrap	.....	.....	140,982	17,936
Rubber manufactures	.....	12,124	.....	347,776
Totals	6,196,601	$1,197,247	72,522,945	$18,616,026

EXPORTS OF DOMESTIC MERCHANDISE

MANUFACTURED				
Reclaimed	1,508,488	$105,553	21,452,956	$1,641,067
Scrap and old	5,081,023	228,871	45,325,150	2,301,510
Rubberized piece goods and hospital sheeting *sq. yd.*	144,166	69,742	1,774,462	861,601
Footwear				
Boots *pairs*	126,678	245,715	1,263,237	2,816,934
Shoes *pairs*	119,792	123,352	2,524,909	2,758,393
Canvas shoes with rubber soles *pairs*	469,990	336,780	5,313,375	3,674,723
Rubber water bottles and fountain syringes *number*	21,522	12,663	360,392	226,033
Rubber gloves *doz. pairs*	7,667	22,167	94,364	273,454
Other druggists' rubber sundries	.....	43,847	.....	430,330
Rubber balloons *gross*	81,684	86,661	625,007	751,137
Rubber toys and balls	.....	12,718	.....	203,117
Bathing caps *doz.*	2,777	6,322	162,239	374,615
Hard rubber goods				
Electrical hard rubber goods	211,049	37,976	1,646,969	328,468
Others	.....	29,307	.....	352,686
Tires				
Casings, auto *number*	248,752	2,804,334	2,507,685	31,064,635
Tubes, auto *number*	155,544	323,867	1,655,807	3,531,046
Other casings and tubes *number*	6,899	9,840	62,153	126,252
Solid tires for automobiles and motor trucks *number*	3,914	118,366	56,644	1,803,168
Others	189,859	30,722	1,854,020	400,247
Tire accessories	.....	126,835	.....	1,635,495
Rubber and friction tape	160,207	46,884	1,589,736	483,398
Belting	387,758	216,969	4,887,206	2,785,238
Hose	460,930	164,571	7,271,821	2,619,533
Packing	219,032	103,434	2,628,741	1,213,010
Soles and hees *doz pairs*	142,781	158,202	1,468,635	1,910,647
Thread	155,858	176,943	1,601,440	1,763,864
Rubber bands and erasers	77,997	48,567	913,197	602,496
Other rubber manufactures	.....	226,753	.....	2,612,521
Totals	.....	$5,917,961	.....	$69,545,618

*Liquid latex included.

Crude Rubber Imports by Customs Districts

	*January, 1928		*January, 1929	
	Pounds	Value	Pounds	Value
Massachusetts	5,659,092	$1,817,185	4,488,269	$742,382
New York	78,452,316	27,351,021	108,612,885	19,443,743
Philadelphia	.....	.....	290,768	50,469
Maryland	1,290,157	395,749	1,654,367	277,272
Los Angeles	906,153	297,214	8,008,839	1,371,028
San Francisco	70,572	22,963	160,165	32,388
Oregon	22,400	7,501	11,200	1,851
Ohio	1,088,403	343,631	5,498,234	915,833
Colorado	112,000	43,180	257,600	42,963
Totals	87,601,093	$30,278,444	128,982,327	$22,877,929

*Including latex, dry rubber content.

EXPORTS OF RUBBER FROM THE NETHERLAND EAST INDIES IN January totaled 24,783 long tons, of which 5,640 were shipped from Java ports, 8,067 from the East Coast of Sumatra, and 11,076 from all other rubber-producing sections.—*Commerce Reports.*

United Kingdom Statistics

IMPORTS

	January, 1928		January, 1929	
	Pounds	Value	Pounds	Value
UNMANUFACTURED				
Crude Rubber From—				
Straits Settlements	8,453,600	£689,100	20,528,200	£775,679
Federated Malay States	3,732,900	303,698	8,305,900	319,268
British India	1,697,300	137,720	1,404,100	56,912
Ceylon and Dependencies	2,991,500	242,555	4,087,500	162,409
Other Dutch possessions in Indian Seas	3,284,300	266,467	3,440,400	144,618
Dutch East Indies (except other Dutch possessions in Indian Seas)	2,793,500	226,379	2,242,500	88,554
Other countries in East Indies and Pacific not elsewhere specified	417,400	33,552	147,000	5,483
Brazil	888,600	55,046	1,210,800	49,001
South and Central America (except Brazil)	31,900	2,256	23,500	815
West Africa				
French West Africa	.....	.....	.....	.....
Gold Coast	45,900	3,542	35,100	1,368
Other parts of West Africa	167,700	10,760	309,000	11,594
East Africa, including Madagascar	145,500	11,622	133,800	5,573
Other countries	104,000	7,451	137,600	5,167
Totals	24,754,100	£1,990,148	42,005,400	£1,626,441
Gutta percha and balata	374,900	38,976	904,700	66,123
Waste and reclaimed rubber	1,151,900	16,953	900,600	9,543
Rubber substitutes	3,300	70	14,400	307
Totals	26,284,200	£2,046,147	43,825,100	£1,702,414
MANUFACTURED				
*†‡Tires and tubes Pneumatic				
Outer covers	.....	£58,782	.....	£53,739
Inner tubes	.....	6,609	.....	7,478
Solid tires	.....	6,555	.....	6,303
Boots and shoes *doz. pairs*	43,090	95,182	86,975	116,342
Other rubber manufactures	.....	128,742	.....	171,857
Totals	.....	£295,870	.....	£355,719

EXPORTS

UNMANUFACTURED				
Waste and reclaimed rubber	2,291,700	£25,018	3,698,100	£23,836
Rubber substitutes	42,700	1,079	37,500	822
Totals	2,334,400	£26,097	3,735,600	£24,658
MANUFACTURED				
*‡Tires and tubes Pneumatic				
Outer covers	.....	£155,204	.....	£250,607
Inner tubes	.....	32,068	.....	37,355
Solid tires	.....	20,706	.....	16,091
Boots and shoes *doz. pairs*	15,778	24,961	19,775	36,854
Other rubber manufactures	.....	222,936	.....	254,596
Totals	.....	£455,875	.....	£595,503

EXPORTS—COLONIAL AND FOREIGN

UNMANUFACTURED				
Crude Rubber To—				
Russia	1,281,400	£108,335	123,400	£4,687
Sweden, Norway and Denmark	61,600	5,892	351,700	14,972
Germany	3,611,000	286,151	3,756,000	139,970
Belgium	644,100	50,022	1,215,700	48,432
France	3,723,600	308,507	5,135,400	194,871
Spain	194,000	17,443	328,600	12,452
Italy	1,604,100	132,644	1,158,700	50,921
Other European countries	346,300	34,169	870,100	31,688
United States	8,886,000	698,748	2,138,000	81,920
Canada	2,300	286	.....	.....
Other countries	95,800	8,194	158,500	7,893
Totals	20,450,200	£1,650,391	15,236,100	£587,806
Gutta percha and balata	85,600	10,561	219,100	13,135
Waste and reclaimed rubber	12,800	283	50,600	563
Rubber substitutes	.....	.....	.....	.....
Totals	20,549,600	£1,661,235	15,505,800	£601,504
MANUFACTURED				
*‡Tires and tubes Pneumatic				
Outer covers	.....	£7,113	.....	£7,872
Inner tubes	.....	976	.....	749
Solid tires	.....	759	.....	366
Boots and shoes *doz. pairs*	370	1,274	941	2,440
Other rubber manufactures	.....	8,774	.....	7,375
Totals	.....	£18,896	.....	£18,802

*After April 12, 1927, tires and tubes imported or exported with complete vehicles or chassis, or fitted to wheels imported separately, are included under complete vehicles or parts.

†Motor cars, motorcycles, parts and accessories, liable to duty from Sept. 29, 1915, until Aug. 1, 1924, inclusive, and after July 1, 1925. Commercial vehicles, parts and accessories were exempt from duty until Apr. 30, 1926, inclusive, and rubber tires and tubes until Apr. 11, 1927, inclusive.

‡Tires and tubes included prior to Apr. 12, 1927.

Crude Rubber Arrivals at New York as Reported by Importers

Plantations

	Cases
FEB. 18. By "Ascania," London.	
General Rubber Co	255
Poel & Kelly, Inc	22
FEB. 18. By "City of Perth," Far East.	
Poel & Kelly, Inc	*426
FEB. 18. By "Dardanus," Far East.	
Poel & Kelly, Inc	*70
FEB. 18. By "Elveric," Far East.	
H. A. Astlett & Co	250
Robert Badenhop Corp	50
Bierrie & Co., Inc	250
Littlejohn & Co., Inc	932
The Meyer & Brown Corp	*400
Poel & Kelly, Inc	56
Chas. T. Wilson Co., Inc	579
FEB. 18. By "Greystoke Castle," Far East.	
H. A. Astlett & Co	4,781
Robert Badenhop Corp.....pkgs.	210
Baird Rubber & Trading Co., Inc	515
Bierrie & Co., Inc	300
N. Diamond & Co., Inc	100
General Rubber Co	11,517
B. W. Henderson & Co., Inc	135
Lavino American & Asiatic Co	1,050
Littlejohn & Co., Inc	6,953
The Meyer & Brown Corp	2,096
H. Muehlstein & Co., Inc	418
Poel & Kelly, Inc	615
Rogers Brown & Crocker Bros., Inc	1,260
Chas. T. Wilson Co., Inc	1,563
FEB. 18. By "Madapur," Far East.	
General Rubber Co	140
FEB. 19. By "Pres. Wilson," Far East.	
H. A. Astlett & Co	2,377
Robert Badenhop Corp	610
Baird Rubber & Trading Co., Inc	900
Paul Bertuch & Co., Inc	100
Bierrie & Co., Inc	150
General Rubber Co	4,917
B. W. Henderson & Co., Inc	50
Hood Rubber Co	*50
Lavino American & Asiatic Co	135
Littlejohn & Co., Inc	3,611
The Meyer & Brown Corp	1,128
The Meyer & Brown Corp	*50
H. Muehlstein & Co., Inc	738
Poel & Kelly, Inc	810
Raw Products Co	250
Rogers Brown & Crocker Bros., Inc	475
Chas. T. Wilson Co., Inc	1,236
FEB. 20. By "Silverbelle," Far East.	
H. A. Astlett & Co	4,693
Robert Badenhop Corp.....pkgs.	360
Baird Rubber & Trading Co., Inc	280
Bierrie & Co., Inc	842
General Rubber Co	8,855
Haldane & Co., Inc	124
Hood Rubber Co	35
Lavino American & Asiatic Co	1,450
Littlejohn & Co., Inc	6,840
The Meyer & Brown Corp	2,664
The Meyer & Brown Corp	*198
H. Muehlstein & Co., Inc	680
Poel & Kelly, Inc	912
Raw Products Co	550
Rogers Brown & Crocker Bros., Inc	1,735
Chas. T. Wilson Co., Inc	1,319
FEB. 21. By "Sitoebondo," Far East.	
H. A. Astlett & Co	200
Robert Badenhop Corp	848
Bierrie & Co., Inc	64
General Rubber Co	3,160
B. W. Henderson & Co., Inc	413
Hood Rubber Co	*88
Lavino American & Asiatic Co	50
Littlejohn & Co., Inc	280
The Meyer & Brown Corp	293
H. Muehlstein & Co., Inc	681
Rogers Brown & Crocker Bros., Inc	339
Chas. T. Wilson Co., Inc	100
FEB. 22. By "American Shipper," Far East.	
The Meyer & Brown Corp	50
FEB. 23. By "Golden Hind," Far East.	
Littlejohn & Co., Inc	†280
FEB. 23. By "Silvermaple," Far East.	
H. A. Astlett & Co	841
Robert Badenhop Corp.....pkgs.	1,692
Baird Rubber & Trading Co., Inc	300
Paul Bertuch & Co., Inc	100
Bierrie & Co., Inc	690
General Rubber Co	10,409
B. W. Henderson & Co., Inc	570
Hood Rubber Co	267
Littlejohn & Co., Inc	4,570
The Meyer & Brown Corp	1,461
H. Muehlstein & Co., Inc	500
Poel & Kelly, Inc	260
Poel & Kelly, Inc	*42
Raw Products Co	350
Rogers Brown & Crocker Bros., Inc	1,139
Rogers Brown & Crocker Bros., Inc	*110
Chas. T. Wilson Co., Inc	902
FEB. 24. By "City of Shanghai," Far East.	
H. A. Astlett & Co	189
Robert Badenhop Corp	42
Baird Rubber & Trading Co., Inc	320
Bierrie & Co., Inc	56
General Rubber Co	1,014
Littlejohn & Co., Inc	1,434
The Meyer & Brown Corp	531
The Meyer & Brown Corp	†224
H. Muehlstein & Co., Inc	470
Poel & Kelly, Inc	205
Rogers Brown & Crocker Bros., Inc	1,475
Chas. T. Wilson Co., Inc	176
FEB. 24. By "Pres. Grant," Far East.	
Baird Rubber & Trading Co., Inc	†250
Littlejohn & Co., Inc	†666
H. Muehlstein & Co., Inc	†860
FEB. 25. By "Kendal Castle," Far East.	
H. A. Astlett & Co	3,072
Robert Badenhop Corp.....pkgs.	818
Baird Rubber & Trading Co., Inc	395
Bierrie & Co., Inc	200
General Rubber Co	15,084
Haldane & Co., Inc	250
B. W. Henderson & Co., Inc	573
Littlejohn & Co., Inc	6,081
The Meyer & Brown Corp	1,699
H. Muehlstein & Co., Inc	1,465
Poel & Kelly, Inc	525
Rogers Brown & Crocker Bros., Inc	2,105
Chas. T. Wilson Co., Inc	2,546
FEB. 25. By "Matra," Far East.	
H. A. Astlett & Co	730
Robert Badenhop Corp	168
Baird Rubber & Trading Co., Inc	70
Bierrie & Co., Inc	224
General Rubber Co	1,447
Littlejohn & Co., Inc	30
The Meyer & Brown Corp	1,820
The Meyer & Brown Corp	*800
H. Muehlstein & Co., Inc	1,410
Poel & Kelly, Inc	280
Chas. T. Wilson Co., Inc	385
FEB. 25. By "Minnetonka," London.	
General Rubber Co	330
Chas. T. Wilson Co., Inc	776
FEB. 25. By "Steel Mariner," Far East.	
H. A. Astlett & Co	2,793
Robert Badenhop Corp	350
Baird Rubber & Trading Co., Inc	525
Bierrie & Co., Inc	150
General Rubber Co	3,077
B. W. Henderson & Co., Inc	250
Lavino American & Asiatic Co	165
Littlejohn & Co., Inc	2,156
The Meyer & Brown Corp	702
The Meyer & Brown Corp	*200
H. Muehlstein & Co., Inc	580
Poel & Kelly, Inc	250
Poel & Kelly, Inc	*348
Raw Products Co	140
Rogers Brown & Crocker Bros., Inc	1,151
Chas. T. Wilson Co., Inc	750
FEB. 26. By "Cedric," Europe.	
Littlejohn & Co., Inc	90
Chas. T. Wilson Co., Inc	42
FEB. 28. By "Vechtdyk," Far East.	
The Meyer & Brown Corp	333
Poel & Kelly, Inc	467
Chas. T. Wilson Co., Inc	14
MAR. 4. By "Aurania." Far East.	
H. Muehlstein & Co., Inc	136
MAR. 4. By "Hubert," Para.	
The Meyer & Brown Corp	626
MAR. 4. By "Missouri," Europe.	
Littlejohn & Co., Inc	1,190
H. Muehlstein & Co., Inc	271
MAR. 5. By "Egremont," Far East.	
Bierrie & Co., Inc	112
Littlejohn & Co., Inc	112
Chas. T. Wilson Co., Inc	289
MAR. 5. By "Minnekahda," London.	
H. A. Astlett & Co	195
Chas. T. Wilson Co., Inc	139
MAR. 5. By "Pres. Van Buren," Far East.	
H. A. Astlett & Co	3,859
Robert Badenhop Corp.....pkgs.	220
Baird Rubber & Trading Co., Inc	1,586
Paul Bertuch & Co., Inc	300
Bierrie & Co., Inc	1,162
General Rubber Co	4,275
Haldane & Co., Inc	250
B. W. Henderson & Co., Inc	1,000
Hood Rubber Co	*101
Lavino American & Asiatic Co	600
Littlejohn & Co., Inc	2,921
The Meyer & Brown Corp	1,910
H. Muehlstein & Co., Inc	468
Poel & Kelly, Inc	1,520
Raw Products Co	278
Rogers Brown & Crocker Bros., Inc	375
Chas. T. Wilson Co., Inc	867
MAR. 5. By "Royal Prince," Far East.	
H. A. Astlett & Co	4,419
Robert Badenhop Corp.....pkgs.	595
Baird Rubber & Trading Co., Inc	420
Baird Rubber & Trading Co., Inc	*100
Paul Bertuch & Co., Inc	100
Bierrie & Co., Inc	500
N. Diamond & Co., Inc	420
General Rubber Co	7,530
Haldane & Co., Inc	200
Hood Rubber Co	*150
Lavino American & Asiatic Co	340
Littlejohn & Co., Inc	3,315
The Meyer & Brown Corp	2,091
H. Muehlstein & Co., Inc	680
Poel & Kelly, Inc	420
Raw Products Co	190
Rogers Brown & Crocker Bros., Inc	1,682
Chas. T. Wilson Co., Inc	1,986
MAR. 8. By "Bengkalis," Far East.	
H. A. Astlett & Co	†476
H. Muehlstein & Co., Inc	†896
MAR. 8. By "Korea Maru," Far East.	
The Meyer & Brown Corp	100
MAR. 8. By "Larchbank," Far East.	
H. A. Astlett & Co	250
Robert Badenhop Corp	85
N. Diamond & Co., Inc	70
General Rubber Co	265
Littlejohn & Co., Inc	2,296
The Meyer & Brown Corp	284
The Meyer & Brown Corp	*320
H. Muehlstein & Co., Inc	140
Rogers Brown & Crocker Bros., Inc	162
Chas. T. Wilson Co., Inc	230
MAR. 9. By "City of Chester," Far East.	
H. A. Astlett & Co	3,057
N. Diamond & Co., Inc	75
Lavino American & Asiatic Co	40
MAR. 10. By "Eumaeus," Far East.	
H. A. Astlett & Co	2,835
Robert Badenhop Corp.....pkgs.	460
Baird Rubber & Trading Co., Inc	100
Baird Rubber & Trading Co., Inc	*805
Bierrie & Co., Inc	436
N. Diamond & Co., Inc	155
General Rubber Co	9,400
Haldane & Co., Inc	1,324
Hood Rubber Co	75
Lavino American & Asiatic Co	80
Littlejohn & Co., Inc	3,422
The Meyer & Brown Corp	2,778
The Meyer & Brown Corp	*160
H. Muehlstein & Co., Inc	2,081
Poel & Kelly, Inc	966
Raw Products Co	150
Rogers Brown & Crocker Bros., Inc	420
Rogers Brown & Crocker Bros., Inc	*2,119
Chas T. Wilson Co., Inc	2,182
MAR. 10. By "Pres. Cleveland," Far East.	
Littlejohn & Co., Inc	†270
H. Muehlstein & Co., Inc	†500
MAR. 11. By "Ausonia," Far East.	
General Rubber Co	105
Chas. T. Wilson Co., Inc	50
MAR. 11. By "Minnewaska." London.	
H. A. Astlett & Co	37
Chas. T. Wilson Co., Inc	152
MAR. 11. By "Sembilan," Far East.	
H. A. Astlett & Co	3,166
Robert Badenhop Corp.....pkgs.	878
Baird Rubber & Trading Co., Inc	253
Bierrie & Co., Inc	759
General Rubber Co	8,414
Haldane & Co., Inc	250
Littlejohn & Co., Inc	1,864
The Meyer & Brown Corp	1,496
H. Muehlstein & Co., Inc	986
Poel & Kelly, Inc	434
Raw Products Co	152
Rogers Brown & Crocker Bros., Inc	214
Chas. T. Wilson Co., Inc	169
MAR. 11. By "Silverlarch," Far East.	
The Meyer & Brown Corp	†350

*Arrived at Boston.
†Arrived at Los Angeles.

	Cases
Mar. 13. By "City of Johannesburg," Far East.	
H. A. Astlett & Co.	4,971
Robert Badenhop Corp.	pkgs. 1,215
Baird Rubber & Trading Co., Inc.	1,193
Baird Rubber & Trading Co., Inc.	*150
Bierrie & Co., Inc.	1,130
N. Diamond & Co., Inc.	293
General Rubber Co.	11,715
Haldane & Co., Inc.	1,610
Hood Rubber Co.	133
Lavino American & Asiatic Co.	280
Littlejohn & Co., Inc.	9,310
The Meyer & Brown Corp.	2,639
H. Muehlstein & Co., Inc.	896
Poel & Kelly, Inc.	1,760
Raw Products Co.	534
Rogers Brown & Crocker Bros., Inc.	972
Rogers Brown & Crocker Bros., Inc.	*375
Chas. T. Wilson Co., Inc.	1,760
Mar. 13. By "Golden Sun," Far East.	
Littlejohn & Co., Inc.	†335
The Meyer & Brown Corp.	†256

*Arrived at Boston.
†Arrived at Los Angeles.

	Cases
Mar. 14. By "Fairfield City," Far East.	
H. A. Astlett & Co.	2,680
Robert Badenhop Corp.	bales 70
Baird Rubber & Trading Co., Inc.	568
Bierrie & Co., Inc.	714
N. Diamond & Co., Inc.	100
Haldane & Co., Inc.	256
Hood Rubber Co.	39
Lavino American & Asiatic Co.	185
Littlejohn & Co., Inc.	2,690
The Meyer & Brown Corp.	731
H. Muehlstein & Co., Inc.	390
Poel & Kelly, Inc.	653
Rogers Brown & Crocker Bros., Inc.	1,234
Mar. 15. By "Francis," South America.	
The Meyer & Brown Corp.	250
Mar. 15. By "Westerdyk," Far East.	
H. A. Astlett & Co.	50
Littlejohn & Co., Inc.	105

Balata

Mar. 2. By "Hubert," Peru.	
Paul Bertuch & Co., Inc.	11

Africans

	Cases
Feb. 24. By "Sacarappa," Antwerp.	
Baird Rubber & Trading Co., Inc.	47
Mar. 11. By "Arabic," Antwerp.	
Baird Rubber & Trading Co., Inc.	casks. 25

Rubber Latex

Feb. 19. By "Pres. Wilson," Far East.	
Rogers Brown & Crocker Bros., Inc.	gals. *50
Feb. 20. By "Silverbelle," Far East.	
General Rubber Co.	gals. 63,718
Feb. 23. By "Silvermaple," Far East.	
General Rubber Co.	gals. 39,755
Feb. 25. By "Kendal Castle," Far East.	
General Rubber Co.	gals. 35,917
Littlejohn & Co., Inc.	gals. 997
Mar. 5. By "Pres. Van Buren," Far East.	
Rogers Brown & Crocker Bros., Inc.	gals. 594

Paras and Caucho

	Fine Cases	Medium Cases	Coarse Cases	Caucho Cases	Miscel. Cases
Feb. 15. By "Bilcco," South America.					
H. A. Astlett & Co.	200	....	292	98	....
Mar. 2. By "Hubert," South America.					
H. A. Astlett & Co.	340	15	256	228	....
Paul Bertuch & Co., Inc.	530	....	....	....	....
General Rubber Co.	1,002	3	203	145	3
Littlejohn & Co., Inc.	896	34	....	....	....
Mar. 13. By "Pan American," South America.					
Paul Bertuch & Co., Inc.	18	....	....	....	....
Mar. 15. By "Barreado," South America.					
Littlejohn & Co., Inc.	96	....	....	....	....
Mar. 15. By "Francis," South America.					
Paul Bertuch & Co., Inc.	380	....	....	....	....
General Rubber Co.	338	....	....	....	....
Littlejohn & Co., Inc.	167	....	45	....	....

United States Crude and Waste Rubber Imports for 1929 by Months

	Plantations	Paras	Africans	Centrals	Guayule	Manicobas and Matto Grosso	Total 1929	Total 1928	Balata	Miscellaneous	Waste
January ..... tons	51,202	1,055	30	5	...	13	52,305	46,243	67	799	181
February	63,851	530	60	97	...	..	64,538	29,445	80	1,220	319
Total, two months, 1929 ..... tons	115,053	1,585	90	102	...	13	116,843	.....	147	2,019	500
Total, two months, 1928 ..... tons	71,520	2,336	558	251	1,022	1	.....	75,688	178	1,809	558

Compiled from Rubber Association statistics.

Ceylon Rubber Exports

January 1 to December 31, 1928

	Tons
To United Kingdom	13,060.20
Continent	5,427.07
Australia	1,273.65
America	37,835.57
Egypt	14.00
Africa	28.03
India	28.35
Japan	151.99
Other countries in Asia	6.62
Total	57,825.48
For the same period last year	55,355.77

Annual Exports, 1921-1927

	Tons
For the year 1927	55,355.77
1926	58,799.56
1925	45,697.19
1924	37,351.13
1923	37,111.88
1922	47,367.14
1921	40,210.31

Plantation Rubber Exports from Malaya*

	January 1 to December 31, 1928		
	From Singapore Tons	From Penang Tons	From Malacca Tons
To United Kingdom	4,827.69	6,880.91	6,987.30
British Possessions	2,856.77	237.00	290.00
Continent of Europe	10,841.80	2,043.67	3,128.11
United States	137,866.35	28,484.49	11,508.09
Japan	17,557.00	2,405.50	1,584.00
Other countries	367.83	.....	.....
Totals	174,317.44	40,051.57	23,497.50

*Excluding all foreign transhipment.

Plumbers Study Tire Men's Plans

Distributers of rubber products find others quite as much troubled as they with the problem of competing with the chain stores. Now it is the master plumbers and heating contractors who fear that the "chains" will soon attempt to poach on their preserves. It is said that "chain" experts have figured that they can easily and with much profit eliminate most plumbing and heating dealers and contractors. Some of the better master workmen might be allowed to exist, but only for making installations and for supervising "chain" merchandising after their business has been absorbed by the "chains," which now roll up a volume of $7,500,000,000 annually.

It is said by way of comfort that chain store merchandising has not yet reached one-fifth of the total of American retail business; but the master plumbers and heating contractors, realizing that the "chains" will not be content with that proportion of trade, have begun to study ways and means of self preservation. Complaining bitterly of unfair practices on the part of some manufacturers that weaken the position of installing retailers, the latter urge the former to abandon irregular dealings and to give them such protection as is assured tire distributers by the Rubber Institute, Inc.; and leaders are also advocating the forming of associations modeled after some very efficient regional organizations of tire dealers, who like the plumbers and heating men, in competing with the "chains," market not only merchandise but also expert service.

Imports, Consumption and Stocks

The accompanying graph covers crude rubber importations, consumption and stocks by months for the years 1927 to 1928, inclusive, and for January, February and March of 1929. The figures for March are estimates.

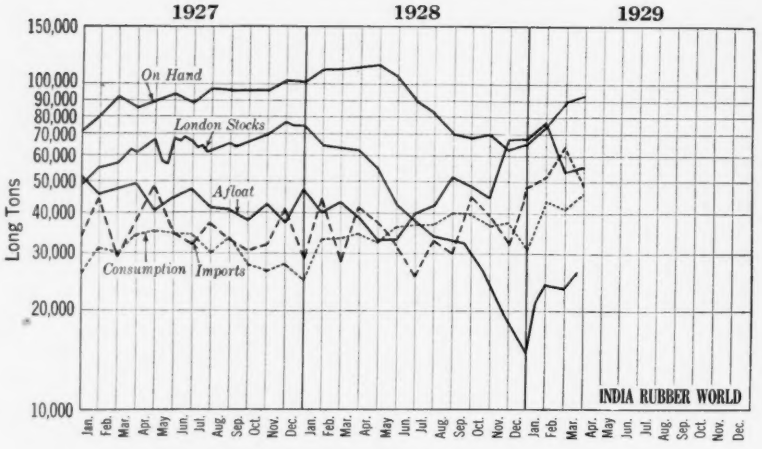
The corrected imports for February totaled 64,528 tons or 4,528 tons over the estimated amount.

The corrected consumption for February was 41,594 tons or 2,594 more than estimated.

March estimated consumption is placed at 46,000 tons. The other estimates for March are: on hand 93,000 tons and afloat 55,000 tons.

London stocks continue to increase and since January 1 have risen from about 25,000 tons to 27,656 on March 23.

The following is the weekly record of London stock movement from March 2 to 23 inclusive: March 2, 25,441 tons; March 9, 25,920 tons; March 16, 26,442 tons; March 23, 27,656 tons.



United States Imports, Consumption and Stocks

Twelve Months	Imports Tons	Consumption Tons	Stocks On Hand Tons	Stocks Afloat Tons	London Tons	Singapore and Penang Tons
1925	384,837	389,136	51,000*	48,000*	.....	.....
1926	411,900	366,140	72,510*	52,019*	.....	.....
1927	426,258	370,915	100,130*	47,939*	63,207*	25,868*
1928	448,378	441,336	66,166*	68,764*	24,423†	34,432*
1929						
January	52,305	43,000	76,342	78,596	24,423	33,119
February	64,528	41,594	90,058	53,825	25,000	.....
March (est)	49,000	46,000	93,000	55,000	27,656	.....

*December 31. †January 26.
The 1928 figures, unless otherwise specified, are all as of the first of each month.

Tire Production Statistics

	High Pressure Pneumatic Casings: All Types Inventory	All Types Production	All Types Total Shipments	Cord Inventory	Cord Production	Cord Total Shipments
1928	.....	58,457,863	55,721,937	.....	19,302,218	19,351,380
1929						
January	10,284,158	5,041,530	4,969,647	3,651,041	1,563,554	1,461,104

	Balloon Casings Inventory	Balloon Casings Production	Balloon Casings Total Shipments	Solid and Cushion Tires Inventory	Solid and Cushion Tires Production	Solid and Cushion Tires Total Shipments
1928	.....	38,878,218	35,931,982	.....	508,223	512,602
1929						
January	6,583,958	3,470,596	3,499,121	150,555	31,927	33,537

	High Pressure Inner Tubes Inventory	High Pressure Inner Tubes Production	High Pressure Inner Tubes Total Shipments	Balloon Inner Tubes Inventory	Balloon Inner Tubes Production	Balloon Inner Tubes Total Shipments
1928	.....	23,255,891	23,749,966	.....	36,878,990	34,095,223
1929						
January	4,734,477	1,540,272	1,800,676	6,805,018	3,347,660	3,630,579

	Cotton and Rubber Consumption Casings, Tubes, Solid and Cushion Tires: Cotton Fabric Pounds	Crude Rubber Pounds
1928	222,243,398	600,423,401
1929		
January	19,779,481	54,160,529

Rubber Association figures representing 75 per cent of the industry.

Seeks Data on Sponge Rubber

Sponge or cellular rubber is a product which during recent years has been attracting considerable attention for a variety of purposes, among which may be mentioned thermal insulation for cold storage chambers, life-saving garments, upholstery and the like. The need for data in regard to physical properties of the material, and tests for determining its character and durability, is consequently becoming increasingly apparent.—*India Rubber Journal.*

World Rubber Absorption—Net Imports

	Total Jan.-Sept. 1927	Total Jan.-Sept. 1928	Long Tons—1928 Oct.	Nov.	Dec.
Australia	6,504	6,072	766	337	755
Belgium	4,493	6,079	696	544	639
Canada	20,397	22,531	2,943	2,799	2,618
Czechoslovakia	1,692	2,338	318	282	200
Denmark	426	352	104	59	51
Finland	509	569	65	80	54
France	22,436	25,919	3,728	3,278	3,633
Germany	27,373	27,305	4,386	3,694	2,470
Italy	7,731	8,899	1,049	1,340	1,145
Japan	14,270	16,758	3,711	2,150	3,026
Netherlands	386	1,923	141	31	148
Norway	479	502	86	64	76
Russia	8,250	12,969	....	....	....
Spain	1,388	2,413	250	252	263
Sweden	1,422	1,696	272	134	254
United Kingdom	52,364	482	934	*3,141	8,438
United States	306,607	288,204	41,667	33,836	40,781
U. S. (Guayule)	3,696	3,076	....	....	....
Totals	480,423	428,087	....	....	....

*Excess of reexports over imports.
Compiled by Rubber Division, Department of Commerce, Washington, D. C.

World Rubber Production-Net Exports

British Malaya:	Jan.-Dec. 1927	Jan.-Dec. 1928	Long Tons—1928-1929 Dec.	Jan.	Feb.
Gross exports	371,513	409,430	†66,763	52,546	47,926
Imports	182,843	149,787	11,112	13,415	12,103
Net	188,670	259,643	55,651	39,131	35,823
Ceylon	55,356	57,546	8,127	8,198	7,114
India and Burma	11,321	10,790	1,113	....	....
Sarawak	10,923	10,087	744	873	955
B. N. Borneo	6,602	6,505	*500	*500	495
Siam	5,472	4,813	294	461	....
Java and Madura	55,297	58,848	5,110	5,640	....
Sumatra East Coast	77,815	82,511	8,792	8,067	....
Other N. E. Indies	142,171	121,770	10,896	11,076	....
French Indo-China	8,645	9,601	948	395	965
Other America	2,454	1,490	78	....	....
Amazon Valley	28,782	21,129	2,220	2,134	2,104
Mexican Guayule	5,019	3,076	....	....	....
Africa	8,162	6,124	510	....	....
Totals	606,689	653,933	94,893	....	....

*Estimated.
†Excluding dry content of concentrated latex.
Compiled by Rubber Division, Department of Commerce, Washington, D. C.

Rubber-Bottomed Speed Boats

A British experimenter is trying cured rubber of various kinds and finishing to determine the most suitable for covering the bottoms of fast motor boats. He is convinced that nothing rivals the anti-friction property of wet vulcanized rubber for covering the underside of such craft, and instances the successful use of rubber bearings for propellers of tug and other boats, the sole lubricant being water. It is claimed also that such sheathing could be molded in one piece to fit the bottom of a boat to obviate seams, and by thus lessening surface friction to enable a boat so equipped to fairly ricochet over water at extraordinary speed.